



Socio-Economic Training and Monitoring in Customary Managed Marine Areas in Papua New Guinea

Final Report to
National Oceanic and Atmospheric Administration
International Coral Reef Conservation Program



Participants of February 2011 SEM Pasifika Workshop at Ungakum village doing a practical exercise using SEM Pasifika manual. © WCS 2011

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Summary

Since 2006, the Wildlife Conservation Society (WCS) has been partnering with four coastal communities in New Ireland Province, Papua New Guinea (PNG) to establish and manage customary *tambu* no-take closures, or marine reserves. Our ongoing work with these communities involves ecological monitoring within and outside of these reserves to assess the status of marine resources and effects of management measures; facilitating the production, adoption, and implementation of management plans for these locally managed marine areas (LMMAs); building staff capacity in marine conservation research and community-based conservation, and training staff and villagers in ecological monitoring; and providing technical assistance and facilitation for community management decision-making processes.

This project under NOAA's International Coral Reef Conservation Program aimed to establish a socio-economic monitoring program based on the SEM Pasifika protocol at these four sites. Socio-economic assessments generated data that can inform communities and marine management area committees, as well as WCS, on the effects of no-take closures in the villages over time and guide adaptive management of coastal marine resources. The project emphasized training villagers to undertake the surveys and basic analysis of the results; Provincial Government Fisheries officers were also trained in the monitoring process. WCS consulted with key stakeholders in these villages to develop specific assessment objectives and methods. WCS led two training sessions in the Pasifika SocMon protocol, and guided the participants in conducting the assessments in concert with key stakeholders, analyzing the data, and presenting the results and their implications for existing and future management measures. Two of these sites are members of the PNG Centre for Locally Managed Areas (PNGCLMA), which is trialing the SEM Pasifika process as a model for PNG. Hence, this project furthered the initiative to build a sustainable socio-economic monitoring system suitable for use throughout the country.

Progress towards Project Objectives

Objective 1. *Generate information on marine natural resource and socio-economic parameters associated with these no-take tambu areas so as to gauge the level of appreciation and support for these areas as a management measure and document issues and concerns to be addressed through adjustments in management measures and approaches in the immediate and longer term.*

During the socioeconomic surveys conducted as part of the SEM Pasifika workshop, information was gathered on demographics, resources use and dependence, perceived threats to coastal and marine resources, knowledge of coastal and marine resources, attitudes toward coastal and marine resources, awareness on the importance and value of coastal and marine resources, perceived resource condition and awareness of rules and regulations. See for the reports for the communities for specific survey results. The information collected showed that the Tsoi Island communities are more reliant on their marine resources than those in the Madak region; this was evident in the main

occupational activities that members of these communities are engaged in (see Appendices).

The main sources of income for households within these communities are also reflective of these varying dependences. This in turn indicates the level of compliance with rules and regulations governing the no-take *tambu* areas and, by extension, the level of collaborative effort with the work that WCS is doing within each of these communities. In the long term, this information will assist WCS and the communities concerned to adjust their approach to the management of the coastal and marine resources in order to effectively address the needs on the ground rather than have an overarching system of management for the sake of management alone. This information will enhance WCS' understanding of the effectiveness and relevance of no-take *tambu* areas within each community so as to provide advice and guidance where appropriate.

Objective 2. Build capacity within local communities and Provincial Government, as well as WCS, in the purposes and methods of the SEM Pasifika socio-economic monitoring protocol.

Three SEM Pasifika training workshops were held over the course of this project (see Appendix 1 for full lists of participants). The workshops within the communities provided the opportunity for the community representatives that attended as well as all other interested members of the community to learn about the purpose of socioeconomic surveys. More importantly, they learned how the information derived from the surveys can be useful for effective coastal and marine resource management in their villages. Provincial fisheries officers who attended the workshops stated that they were able to use the visit to various households in the island communities as a way to identify the different types of fishing gears that were used in these communities, which gave them an idea of the target audience for awareness programs they were planning. They were also able to use the interview process to raise awareness for the National Fisheries Authority (NFA) driven program for the retrieval of tuna tags within the island communities (see picture below). WCS staff learned how to use the SEM Pasifika manual and acquired training and monitoring skills, which they were able to transfer when they conducted the next training course themselves in the Madak region.



Provincial fisheries officer Simeon Agar explaining the NFA's tuna tag retrieval program works and how villagers can claim a reward for each type of tag.

Objective 3. *Strengthen partnerships amongst WCS, the PNG CLMA, SPREP, the New Ireland Provincial Government and New Ireland coastal communities to improve efficacy of coastal marine resource management in New Ireland Province.*

This grant provided the avenue for strengthening local capacity for coastal and marine resource management in New Ireland Province through the collaborative effort required to conduct the workshops and surveys. WCS worked with the PNGCLMA, SPREP and the New Ireland Provincial Government to bring such a capacity building exercise down to the local setting of the New Ireland coastal communities of the Tsoi Islands and Madak region. Bringing the training to the community level added more value to the training and increased the awareness within the communities regarding the collaborative effort of these organisations to work with them to sustainably utilise and manage their marine and coastal resources.

Objective 4. *Provide experience in application of the SEM Pasifika protocol in PNG to inform further application across the PNG LMMA Network.*

WCS was able to build the capacity of its staff members in socioeconomic monitoring which was and will continue to be transferred to the local communities it partners with. WCS staff, who both participated in the training sessions and then conducted the training protocol themselves, observed first-hand the strengths and weaknesses of the protocol. In order to make the training more relevant to local situations and to ensure that trainees are sufficiently prepared to adequately address the goals of SEM-Pasifika, we suggest:

- the inclusion of a specific data analysis component to the training
- more time devoted to help community members understand the questions and how to ask them and
- the need for adapting the SEM Pasifika manual and questions to better suit local situations.

PNGCLMA staff were able to experience first-hand the setting in New Ireland communities and identified how to build on the available resources within the SEM Pasifika manual and adapt these to better suit local PNG conditions. SPREP will likewise benefit from these lessons learned which can then be incorporated in a review of the SEM Pasifika manual and its applicability in local communities within the Pacific region.

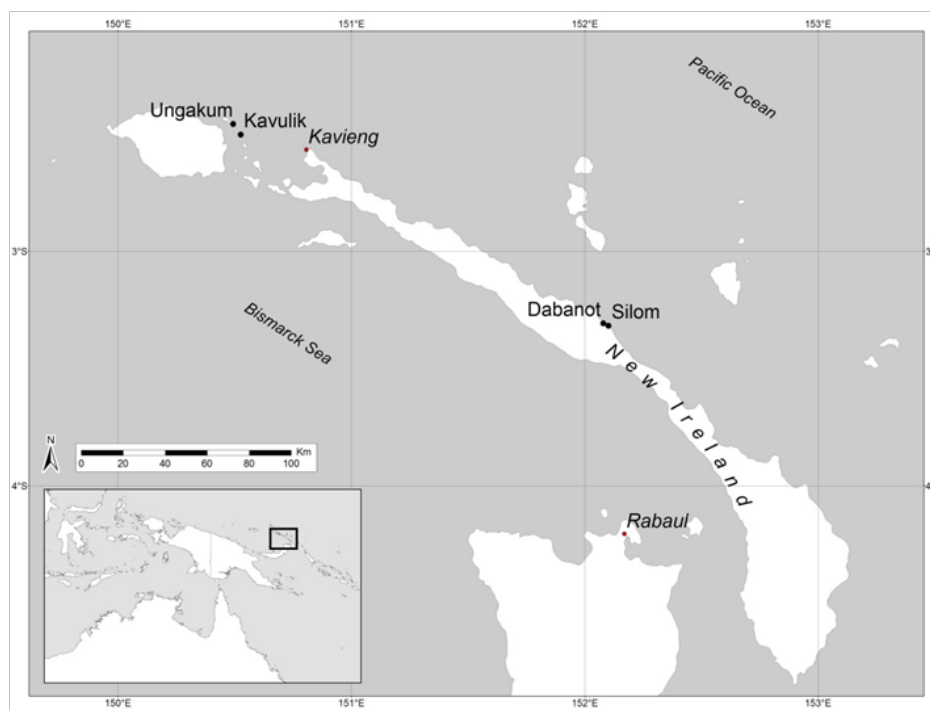


Elison Watlom of Ungakum Village conducting a household interview during the second phase of the SEM Pasifika training in Ungakum Village in February 2011. © WCS 2011

Project Personnel and Collaborators

Ms. Rachael Lahari oversaw the project during its first phase but left WCS for personal reasons in June 2010. Ms. Modi Pontio started with WCS as the PNG Marine Program's Community Engagement Officer in October 2010 and took over as lead manager for the project. Both Ms. Lahari and Ms. Pontio worked alongside the Director of the Marine Program, Katherine Holmes. Other WCS staff and student interns contributed to the execution of the project alongside community members and the collaborating organizations. WCS staff included Tau Morove, Jasmine Duadak, and Jane Wia. Project staff from the PNG Centre for Locally Managed Areas included Rebecca Samuel and Reuben Tuka, guided by their supervisor Maxine Anjiga. Five New Ireland Province Provincial Fisheries Officers were involved at various stages: Manaon Manilias, Simeon Agar, Leonard Jahat (now with the National Fisheries Authority), Vaitas Lasaro, and Elsie Pangogo.

Study Sites



New Ireland Province and the location of the four village sites targeted in this project – Ungakum and Kavulik (of New Hanover) and Dabanot and Silom (of the Madak region of mainland New Ireland) – as well as the provincial capital, Kavieng, which is the site of the WCS PNG Marine Program office.

Project Activities

Over the course of this grant, we encountered several unexpected changes. The original project lead, Rachael Lahari, was on maternity leave from WCS throughout much of the second half of 2009. She returned to full-time work in her position in January 2010 when activities for the Socio-Economic Training and Monitoring Project commenced. Due to various personal reasons, Ms. Lahari left WCS in June 2010. A

new employee, Ms. Modi Pontio, was recruited and hired over the period of June 2010 to August 2010 and commenced work as WCS' Community Engagement Officer in October 2010. Ms. Pontio continued as the project lead. Despite this change in personnel, the project has successfully completed multiple activities toward reaching its objectives. In addition, over the course of the workshops, we discovered some ways to improve the workshops, as well as the socioeconomic surveys in order to make them more useful and understandable to members of PNG communities.

February 2010

WCS staff conducted a meeting with the director of New Ireland Province's Provincial Fisheries Authority. The Director reconfirmed his department's commitment and interest in the project. Four Provincial Fisheries Officers were identified to participate in the project (Manaon Manilias, Vaitas Lasaro, Leonard Jahat, and Simeon Agar).

February and March 2010

WCS staff conducted two meetings with the four participating Provincial Fisheries Officers. All four officers committed to participate in the project.

March 2010

Two WCS staff attended a one-day training in socio-economic training techniques conducted by Transparency International.

Two WCS staff members visited the villages of Silom and Dabanot to discuss the implementation of the SEM-Pasifika socio-economic survey project and to identify potential candidates to participate in the upcoming socio-economic training workshop. Two participants for the socio-economic monitoring training were identified from both Silom and Dabanot Villages.

The same two WCS staff members also visited the villages of Ungakum and Kavulik to discuss the project and identify candidates. Because these communities are larger in size and to avoid potential jealousies, four participants were nominated from each of the two communities. Ungakum identified three and planned to nominate an additional female participant at a later date. Kavulik decided to conduct community meetings during which they nominated four participants. The 12 nominated community participants were evenly split between genders.

March and April 2010

WCS had multiple discussions with the Papua New Guinea Centre for Locally Managed Areas (PNGCLMA) in order to set the dates for the training workshop. The Centre had already conducted training in two other locations in Papua New Guinea. In those cases, participants were all from the same village or region and it was possible to conduct both the initial survey development component and survey testing and implementation over an intensive training period at one location. However, the geography of our target communities presented a unique challenge. The two pairs of communities are many hours apart: one is two hours away from Kavieng by boat and the other is a three-hour truck drive in the opposite direction. It became clear that WCS and PNGCLMA staff

needed to adapt the training program and divide it into two distinct components. The first training session in May would constitute the first component.

May 2010

WCS hosted participants to attend the SEM-Pasifika training workshop from May 18th to 21st at a local NGO's training facility, the Ranguva Solwara Skul (Sea School) of Ailan Awareness. The training was conducted by staff of the PNGCLMA. Maxine Anjiga, the PNGCLMA Director opened the workshop and trainers Rebecca Samuel and Reuben Tuka led the training throughout the week.

Three WCS staff attended and contributed to the workshop while also supporting all the logistics required. A WCS intern also attended and contributed to work that occurred over the course of the workshop.

During the workshop, the participants were taken through intensive sessions where they learned about the nature and value of socio-economic assessments and monitoring, identified the goals of their particular management areas and shaped socio-economic surveys unique to each of their communities.

The workshop participants were anxious to go ahead with the next training sessions and the staff of PNGCLMA confirmed their commitment to return to New Ireland to train the communities in that next phase. Recognizing that the model needed to be adapted to the particular geographies of the four communities, it was decided that the two trainers would return to New Ireland and go to the two communities in the Tsoi Islands then WCS staff would go to the two communities in the Madak region to conduct two separate training and implementation exercises. Although August was identified as an ideal time from the communities' perspectives, the Provincial Fisheries Officers noted that they would be unavailable since they would be collecting data for the National census planned for that time. By the end of the meeting, the dates remained unplanned for the onsite training component.

June to October 2010

Staff changes in the WCS Kavieng office led to a slight delay in program activities until October when Modi Pontio joined WCS. WCS discussed a possible timetable for the next SEM-Pasifika training workshops with PNGCLMA and WCS in New Ireland Province. It was agreed that February 2011 would be an ideal time to conduct the training, since calendars were full before then. For instance, PNGCLMA hosted a national workshop focusing on developing effective marine conservation in PNG in October and the staff were committed to end of year activities in November. December and January are the main holiday period in PNG and is considered a difficult time to work and travel.

December 2010 to February 2011

WCS staff made preparations for the upcoming workshops in 2011. This involved informing the community members of the upcoming visit, and organizing all the logistics for the work.

February to March 2011

WCS hosted the second phase of the SEM-Pasifika training in Ungakum village of the Tsoi Islands. Participants for this training included some who had attended the May 2010 workshop as well as some new participants. One of the original participants from Silom had died a week prior to the workshop, whilst the other had moved away. Neither of the original participants from Dabanot could attend so a new

participant had to be selected. Given this mix of participants for the second phase training, the trainers from PNGCLMA conducted a review of topics covered in the first workshop and then taught the participants how to implement the surveys that had been designed in the first workshop, beginning with emphasis on random selection of the households to be surveyed. From a reconnaissance of both villages, it was decided that given the time available and the distance between Ungakum and Kavulik villages and between some of the houses, that Ungakum would be the survey site. The trainers with assistance from WCS staff oversaw the surveys. Participants were also trained in presenting the results from the surveys back to the community. WCS staff present at this workshop assisted with logistical arrangements whilst also learning the techniques required to carry out the same training in Silom and Dabanot villages later in the project.



Perry Misiel of Ungakum Village conducting an interview during the February 2011 SEM Pasifika Workshop while Rebecca Samuel (PNGCLMA trainer) looks on.

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During this training, WCS staff identified several gaps and areas that could be improved in future trainings that would make them more understandable to PNG communities. These included: taking the participants through the process of developing the questions for the various surveys; explanation about what information each question is designed to collect and how best to ask the questions; actually taking the them through the collation and analysis of the data collected; and how to decide on the best method of data presentation. These topics were set as objectives to be addressed in the training workshop that would take place in Dabanot in the Madak region.

March 2011

Dabanot village was chosen as the community to host the second phase of the SEM Pasifika training for the Madak region. WCS staff Modi Pontio and Jane Wia were chosen as the facilitators. Workshop attendees from the Ungakum training who had also been to the first phase training were invited to assist in this workshop in an effort to further enhance their training as well as foster collaborative efforts between the

communities. Also, since most of the participants from Silom and Dabanot would be new to the training, the community members from Ungakum and Kavulik who participated in the prior workshop were asked to provide assistance in these villages. The workshop began with a reconnaissance of both Silom and Dabanot villages and WCS staff informed the community about the purpose of the workshop and the surveys that would be conducted as part of the training. Following this, the training began with a review of the topics covered in the first two workshops and a reiteration of the new approach that would be taken, incorporating the new objectives to improve the training that were set in the Ungakum workshop.

The participants were guided through the process of identifying indicators for the assessment in these two communities, developing the questions to gather information to address the indicators identified and thereby fostering a better understanding for the purpose of each question. Each question developed was also translated to Tok Pisin by the participants to ensure that everyone would ask the question in the same way so that the information derived would be the same. Similar to the training at Ungakum, participants then went out and conducted the surveys at predetermined households and with key informants. Since both of these communities are small, it was decided that all the households would be targeted for the household survey. A step-by-step approach was employed in assisting the participants analyse the data collected and deciding on the methods of presentation.

Overall the Dabanot workshop was well received, and lays the basis for future socioeconomic surveys and trainings in PNG. The following comments from three of the participants from Ungakum and Kavulik villages after completion of the Dabanot workshop show how the improved approach to these trainings identified by WCS staff has helped to make the workshops and surveys more understandable and useful to communities in PNG.

'Mi lukim olsem i had tasol em trupela wei mipela bihainim long Dabanot. Em trupla wei bai yumi wokim survey lo peles. Mi yet mi laikim olsem mi mas konitu yet lo studi blo mi. Mi wok lo lainin tasol mi laik lainim moa yet.'

I can see that the training is hard but I believe that the way it was conducted at Dabanot was better and it is the right way to conduct surveys in the village. I myself would like to continue with this training because I have learnt a lot but would like to know more.

Marioth Delvin, Kavulik Village

'Woksop lo Dabanot ibin gutpla, mi bin laik lo stap. Mi tok tenkiyu bicos sampla samting mipela ino kilia gut long em, mi go kisim gut lo Dabanot.'

The workshop at Dabanot was good and I enjoyed being there. I would like to say thank you because we were able to better understand some of the things that we weren't so clear on from the previous workshops.

Ranga Kot, Kavulik Village

'Mi lukim olsem mi go kilia moa nau lo wokim survei na mi go kilia moa lo kamapim ol questen na stretpla wei blo askim ol lain na tu lo ripotim ol samting mipla painim aut go bek lo komuniti.'

I now understand better how to conduct the survey as well as how to develop and ask the questions as well as reporting on the findings back to the community.

Jackson Solo, Ungakum Village

Lessons Learned

As communities are different in setting as well as dynamics, there are always differences in the way a capacity building exercise such as the SEM Pasifika Training is delivered and received. The training conducted in New Ireland Province was developed based on lessons learned from similar training workshops conducted in other parts of Papua New Guinea (PNG), such as West New Britain and Madang provinces. And within New Ireland Province, lessons learned from the first workshop in Ungakum were used to better facilitate the next workshop in Dabanot. In this way the project used an adaptive approach in which lessons from once training are used to refine and enhance the next one.

In previous PNGCLMA-run trainings, the trainings were conducted over one intensive week that involved preparing the surveys and implementing them in the later half of the week over day trips to the communities. In the case of New Ireland, we were concerned that a single week would be too intensive for the participants to learn the entire course. But, also, it was logistically difficult to train all the community participants in one training session because the four communities involved are geographically spread out - two 2 hours west of Kavieng by boat, two 3 hours east of Kavieng by road. The training was adapted for New Ireland and was conducted in two parts, each part being a week long. The first part involved bringing participants from the different communities WCS is engaged with to a single location outside of their communities. The second part of the training was conducted within the communities to allow for the socioeconomic surveys developed during the training to be carried out within each community. Response from facilitators was that it was easier for the training to be conducted in this way, but because there was a lag period of several months between the first and the second part of the course, the downside was that it was not possible to bring back all participants to be part of the second training as various people's personal situations had changed. During the training in Ungakum, the facilitators identified areas where the conduct of the training had gone well, as well as aspects in which future trainings could improve upon. WCS staff who attended the Ungakum workshop were able to develop their own capacity as facilitators and successfully conducted the same training workshop for two other communities (Dabanot and Silom) that WCS is engaged with. They were able to build on the successes of the Ungakum training as well as successfully address its shortfalls.

One of the main triumphs in the facilitation of the training workshops in both training workshops was the fact that the facilitators stayed in the community for the duration of the course. This not only offered flexibility in the daily programme but also meant that;

- where participants from the first training could not come for the second training, replacements could easily be found from within the community
- conducting the training within the target community meant that some survey questions could be answered via observation
- course participants had contact with the facilitators after hours for the duration of the course
- facilitators could appreciate community dynamics and how this might affect the data collection process and make appropriate changes such as changing the household survey where some households were inaccessible
- participants were able interview people early in the morning before they left their house for the day or later in the evening. This is something which would not have been possible had the trainers only travelled into the communities during the day as in other past PNG training courses.
- those that were interviewed were also able to go to where the facilitators were camped and ask questions on the purpose of the training. It is hoped that this has added to the community's understanding of the purpose of the training and how the information derived can be used to facilitate adaptive management.
- where mistakes were made during surveys, the participants were able to go back and redo the questions as the facilitators were able to identify these at the end of the day. This would not have been possible had the facilitators stayed outside of the village.
- participants were given ample time to prepare for their final presentations back to the community and showed a thorough understanding of the survey findings and presented with confidence

Aspects of the socioeconomic training workshop previously conducted in Ungakum that were improved upon in the subsequent training workshop conducted in Dabanot included;

- the selection of indicators for the survey were more proactive with the participants being encouraged to select as complete as possible a set of indicators. The facilitators were more hands on in this and explained what each indicator meant. The indicators used for the Ungakum survey were not adequate to gather data that could eventually be used for adaptive management.
- indicators chosen were more appropriate and relevant to the target community and the data collected were therefore reflective of the situation within the community
- participants were taken through the process of developing questions for each of the indicators. The questions on both the household and key informant survey forms for Ungakum were not relevant to the local settings. When the participants were part of the process of developing the questions, they understood the information the questions were designed to collect.

- the survey questions were translated to the local language to aid better understanding and to ensure that the question was being asked correctly
- a specific data analysis component was added to the training, participants were taught how to collate and analyse the data, rather than have the facilitators do the analyses for them. In this way, participants realised the importance of collecting the data properly and completely. Without any idea of how to analyse the data, the communities cannot conduct these surveys on their own and the information has no meaning to them.
- participants were given the chance to decide on how to present the findings back to the community
- one important aspect missing from the training in Ungakum was an evaluation or a feedback from the participants on the overall delivery of the training. This was addressed by having the participants from the Ungakum training (who had been invited to assist with the Dabanot training) provide feedback on both training workshops

Feedback from participants of the second training in Dabanot showed that there was better understanding of the overall process of planning, developing and conducting a socioeconomic survey, although they still felt that more practice would be required for them to become confident enough to conduct a survey on their own.

Specific issues relating to the various questions asked during the surveys are addressed directly in the reports generated for the three communities where the surveys were conducted (see Appendices). These concerns have been addressed through a redesign of the surveys, generating a new Household Survey Form and a new Key Informant Survey Form that can both be implemented at any of the four participating communities. One idea that we are considering is designing a single, combined questionnaire that would be delivered as a Household Survey. The target communities are quite small so, in the end, the Household Survey is given to many of the people already identified as “key informants” so monitors end up asking the same person similar questions from both survey instruments. Secondly, the *tambu* areas are community initiatives and so the whole community should be given the opportunity to respond to those questions.

Marine Management Plans

Communities develop their Marine Management Plans based on how they see their marine resources supporting their livelihoods either through the sale of marine resources or through direct consumption. Their objective for a *tambu* (or marine protected) area is usually to ensure that the community’s supplies of fish, shell fish and other commercial marine resources are maintained into the future.

The socioeconomic monitoring training conducted in New Ireland helped a subset of community members understand the importance of having a better understanding of the contribution and relationship their marine resources have to their livelihoods. The

exercise raised awareness on the importance of good planning and monitoring to complement their efforts in managing their marine resources.

As a direct result of this exercise we are proposing certain changes to the Marine Management Plans for the targeted communities. Any changes to the plans will take several meetings and discussions to ensure community contributions and buy in so, despite our original ambitions, specific changes could not be incorporated within the timeframe of this project. These will be discussed in the months to come during community engagement meetings. The first meeting will take place in Ungakum the week of August 15th to 19th. During this meeting, the WCS Community Engagement Officer will run the meeting and train other WCS staff members in the approach to be used. The approach will include identifying key community members to be involved in the process; a subset of the data collected through SEM-Pasifika process will again be presented to community members; and some Participatory Rural Appraisal Techniques will be used to further explore community's conservation goals. The full WCS biological survey team will be present and able to address specific marine biology, ecology and conservation questions that may arise. They will discuss many of the recommendations and possible revisions and additions to the community's Marine Management Plans. This process will be repeated in Silom and Dabanot in September and October. Communities will need time to further discuss the plans amongst themselves. Not only the information collected but the data collection process itself and the discussions it led to, have helped us develop a greater understanding of people's incentives for marine conservation. The adjustments that we have identified to help communities hone their plans include the following:

1. Communities are going to re-evaluate the resources they have as targets for management. We will help communities identify and prioritize resources to manage and monitor based on organisms they identified during the SEM-Pasifika process. These include, but are not limited to; parrot fishes, surgeon fishes, beche-de-mer, trochus, clams, crabs and hard corals. During this project, community members' raised questions around the importance of size. In Ungakum, we would now like to encourage the Community Biological monitors to survey the size classes of target resources.
2. Surveys revealed that, at all surveyed sites, fishing was not the primary source of income. In Ungakum, more self-identified as copra farmers than fishermen while in Silom and Dabanot, more income was generated through gardening. Because there is not a tremendous pressure on reef resources, communities might want to consider other management options that would allow some fishing within the currently restricted areas. One option could be to remove the complete closure and consider a mixture of management options. These could include assorted gear restrictions and seasonal closures. Gear and size restrictions are possibly less onerous for community members and could allow for management over a greater area under tenure of the community. Depending on community attitudes, these restrictions could improve long-term compliance. These options will be discussed and community members will need to evaluate whether their

community would be better able to comply with a restricted *tambu*-style closure or would prefer various other restrictions.

3. At the time of the surveys, the beche-de-mer industry was closed throughout PNG. This may partially explain the higher dependency on copra as revealed through the surveys. The ban is scheduled to be lifted in 2013 and we hope to repeat socio-economic surveying to monitor shifts in economic activity. The survey process has made us consider this issue and we now hope to incorporate planning for the beche-de-mer opening within the Management Plans that are being developed now. We hope to encourage communities to continue to protect a portion of their marine habitat from harvest after the ban has been lifted.
4. We recognize the need to improve information exchange on the specific animals we are monitoring so community members understand the reasoning behind each management rule applied for the different target animals. For example, where our management plan currently says “it is *tambu* to harvest undersize beche-de-mer “we will include the length restrictions and explain the reasoning for it. Similar clarification will be included for the other important invertebrates, trochus and giant clams. For fin fish, we will clarify why the plans call for restricting the mesh size of fishing nets to less than two and a half (2 ½) inches. Communities will better understand the reasons for certain types of management regimes for the different target species if they understood the life history of the animal and the requirements for its sustainability. They will then be in a better position to decide on the management regime for the different target species. The restrictions will apply regardless of whether the fishing is for subsistence or commercial purposes.
5. All management plans currently outlaw the “use of derris root” (a poison traditionally used to stun fish for easy capture); we are proposing to modify this existing restriction by outlawing of the “possession of derris root” as well. This is so that any person found with derris root in their possession is also guilty of the offence and can be charged under the Tambu Area Management Plan. In addition we would also like to include other poisonous plants such as tapioca for the harvest of octopus on reefs; this practice is just as harmful as the use of derris root. This recommended revision has arisen from another WCS-led project that involved consulting other communities in New Ireland in addition to our current target communities.
6. Our current management plans restrict the throwing of rubbish in the *tambu area* but fails to describe the type of rubbish. We plan to include information on the different type of rubbish and be specific on the proper method for disposal for each type of rubbish.
7. We recognize the need to add habitat-specific components to management plans. These would involve some habitat-specific protections measures. For example, for corals, plans could include banning harvest for building materials or lime production, avoiding anchor damage where possible, and not to step on living corals when possible.

Global Socioeconomic Monitoring Database

Reports for the communities (see Appendices) outline the various places where the original survey instruments designed by the trainers and community members during the SEM-Pasifika training were flawed. These design issues resulted in challenges for data collection by the newly trained socio-economic monitors. Analyses and discussions of these issues have led to the design of survey questions that better match the specific needs and qualities of the coastal communities of New Ireland. The data collected during this training exercise was not of a high enough quality to be posted on the Global Socioeconomic Monitoring Database. If the monitors are able to repeat the surveys with the improved forms, the data will be assessed for accuracy and reliability and, if of high enough quality, it will be reported to the database

Appendices (sent as separate files)

- Appendix 1. SEM-Pasifika Report: Ungakum Village
- Appendix 2. SEM-Pasifika Report: Silom and Dabanot Communities



SEM-Pasifika Training and Assessment in Ungakum, New Ireland Province, PNG

Use of the SEM-Pasifika guidelines to train local community members to assess Socio-economic conditions and attitudes toward marine resource management within the Ungakum Community

**The Wildlife Conservation Society's
PNG Marine Program
and
The PNG Center for Locally Managed Areas**

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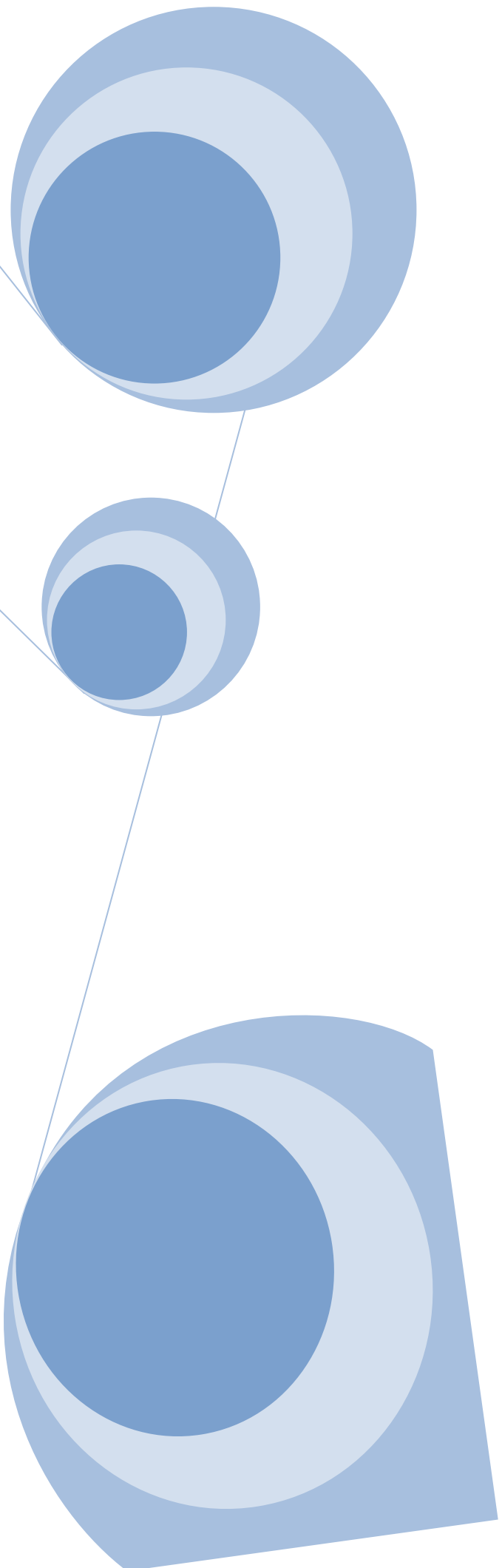
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All photos by WCS.



1. Introduction

A Social Economic Monitoring – Pasifika (SEM-Pasifika or SEM-P) training was organized and conducted by the Wildlife Conservation Society's (WCS) Papua New Guinea Marine Program and the Papua New Guinea Centre for Locally Managed Areas (PNGCLMA) using the socio-economic monitoring or "SocMon" guidelines produced by the NOAA Socio-economic Monitoring program. These guidelines, a collaboration between the South Pacific Regional Environment Program (SPREP), the NOAA Socio-economic Monitoring Program, and other groups, were published to provide basic guidance to nearshore marine and coastal zone managers in socio-economic assessment and monitoring. This report documents the results of a series of training workshops in which participants received training in the SEM-Pasifika methods and, with the guidance of facilitators, conducted socio-economic monitoring planning, data collection, data analyses, and communication activities in New Ireland.

Since 2006, WCS has been partnering with four coastal communities in New Ireland Province, Papua New Guinea (PNG) to establish and manage customary *tambu* no-take closures, or marine reserves. Our ongoing work with these communities involves ecological monitoring within and outside of these reserves to assess the status of marine resources and effects of management measures; facilitating the production, adoption, and implementation of management plans for these locally managed marine areas (LMMAs); building staff capacity in marine conservation research and community-based conservation; training staff and villagers in ecological monitoring; and providing technical assistance and facilitation for community management decision-making processes.

This project, under NOAA's International Coral Reef Conservation Program, aimed to establish a socio-economic monitoring program based on the SEM-Pasifika protocol at these four sites. Socio-economic assessments generated data that can inform communities and marine management area committees, as well as WCS, on the effects of no-take closures in the villages over time and guide adaptive management of coastal marine resources. The project emphasized training villagers to undertake the surveys and basic analyses of the results. Provincial Government Fisheries officers were also trained in the monitoring process. Two of these sites are members of PNGCLMA, which has been tasked with trialing the SEM-Pasifika process as a model for PNG.

Unlike previous SEM-Pasifika trainings conducted by PNGCLMA, this training effort was split into three separate workshops. This was in part due to logistical considerations; the communities are geographically separated with one pair of communities two hours by boat west of Kavieng (the capital of New Ireland Province) and the other pair three hours east by road. Participants met together at a training center just outside of Kavieng for the first part of the training from May 18th to 21st, 2010. This workshop was attended by 12 community members and five provincial fisheries officers. During the workshop, the participants were taken through intensive sessions where they learned about the nature and value of socio-economic assessments and monitoring, identified the goals of their particular management areas and shaped socio-economic surveys unique to each of their communities. The second workshop took place from February 28th to March 5th, 2011 in Ungakum Village when participants were taught to administer the surveys and gathered data within Ungakum Village. This training was attended by nine community members, two fisheries officers and three WCS staff members. They were unable to repeat the data collection in nearby Kavulik Village because the distance between the two communities would not allow monitors to conduct the monitoring on a day's trip. The third workshop took place from March 28th to April 2nd, 2011 in Dabanot Village and was overseen just by WCS staff and participants redesigned their original surveys and were guided in administering and analyzing some of the findings within both Dabanot and Silom Villages. This training was attended by five new participants and four participants that had already attended the training in Ungakum but were included in this training to enhance their skills and

understanding. The challenge we faced with this arrangement was that we could not get all of the same people from the first workshop to attend the Ungakum and Dabanot trainings because some participants were no longer available for various reasons. However this was overcome by spending the first two days of training in both Ungakum and Dabanot on reviewing the theoretical concepts and survey design approach covered in the first workshop before proceeding to administering the surveys.

This report summarizes the process and findings generated by surveys conducted within Ungakum Village.

2. Background and Site Description

New Ireland is located in northern PNG in the Bismarck Archipelago. It consists of 9600 km² of small island groups and the main island of New Ireland. It includes the main islands of East, Tabar, Lihir, Anbir and Tanga island groups and the islands of Lavongai, Dyaul and Tingwon. Most of these islands have mountains in the center of over 500 m, which are surrounded by narrow limestone plains. The outer edges of the island of New Ireland are made up of narrow coastal limestone plains, floodplains and hills. The estimated population of New Ireland is 118,350 (2000 census) with slightly more males than females. Less than half of the total land area is occupied and with a population per square km² of occupied area of 28.4%.

The provincial headquarters, Kavieng, is situated at the northern tip of the island. It has a large, beautiful harbour and is a popular destination for game fishing and surfing enthusiasts. New Ireland is divided into two districts, nine Local Level Governments and 138 Wards.. New Ireland has universal basic education, a literacy rate of 77.4% and the people have an average life expectancy at 57.9 years.

Most people on the main island and from Lavongai earn income from sales of copra, cocoa, oil palm and fish and garden produce. Lihir Island is reputed to have the second largest gold deposit in the world and, together with Simberi gold mine, they provide wages to employees and royalties to landowners. People from the Lelet Plateau on the main island receive good income from the sale of fresh garden food.

New Ireland has a road network that runs the length of the island both on the North and the South coast but is of varying quality. Water transport is most important between all the islands in the province.

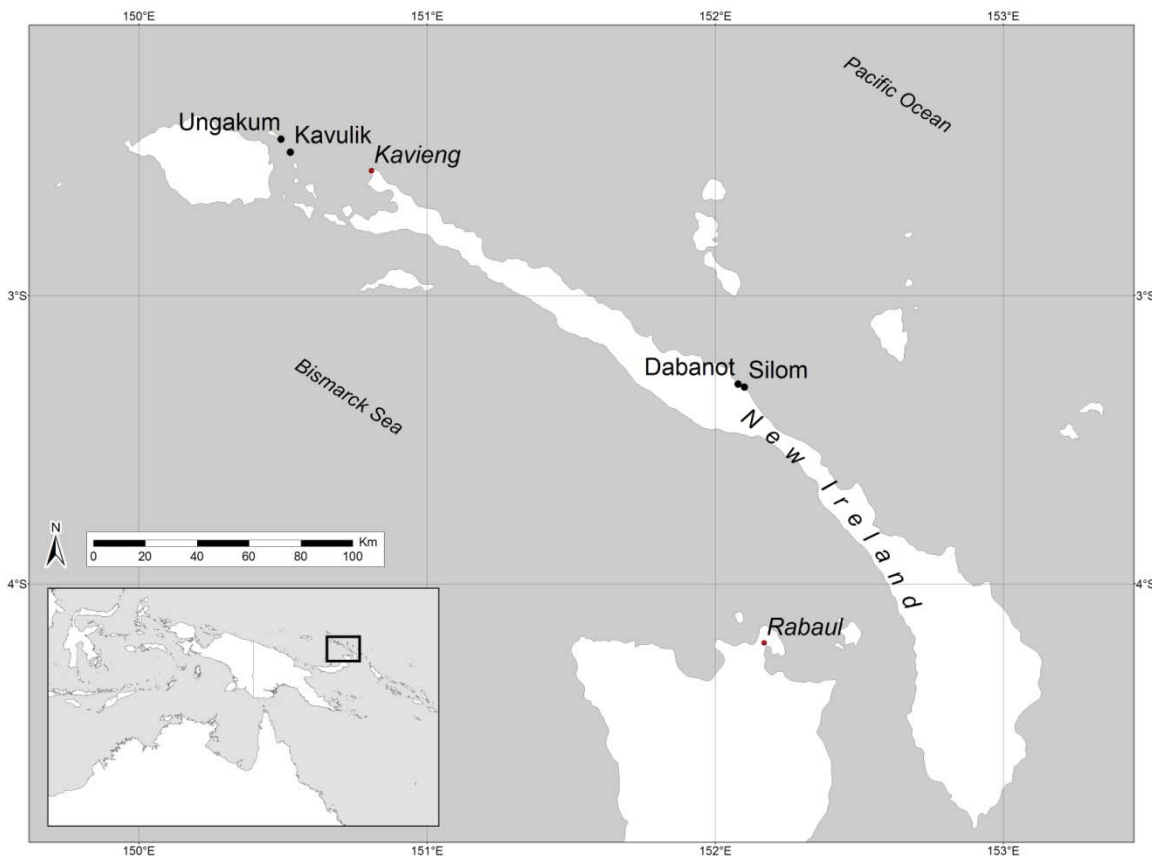
New Ireland prides itself with long stretches of beautiful white sandy beaches and many small, uninhabited islands. The marine ecosystem includes lagoon areas that are quite extensive in some areas, mangrove forests, patches of seagrass, and coral reef areas that lead to sharp drops at the reef edge in some areas while in others the drop is gradual.

Like most places in PNG, New Ireland has a high rural population that depends very heavily on their environment for their livelihood sustenance. As well as maintaining garden crops and livestock, most coastal communities depend very heavily on their marine resources to supplement what they can find from their gardens and bush for their own consumption and for income generation. As a result, their marine resources are at risk from overfishing, sedimentation from land based industrial and agricultural activities such as mining, logging and the effects of climate change. The increase in population also adds pressure on the natural resources. To address these threats some communities have placed management over their marine resources in the form of no-take closures or *tambu areas*. *Tambu areas* are a management tool where communities set aside portions of their marine

tenure to allow recovery of their marine resources. *Tambu* areas can be a semi-closure or complete closure for as long as the community wants.

The Wildlife Conservation Society has worked with the communities of Ungakum, Kavulik in the Tsoi Islands in Lavongai, Kavieng District and with Silom and Dabanot villages along the main island in Namatanai District since 2006 to support the communities' *tambu* area management efforts (see map).

Map 1. New Ireland Province and the location of the four village sites targeted in this project – Ungakum, Kavulik, Dabanot and Silom – as well as the provincial capital, Kavieng, which is the site of the WCS PNG Marine Program office.



Ungakum is situated approximately 40 km northwest of Kavieng within the Tsoi islands, Lavongai. It is a small community clustered within a central village, and has a population of 245 (2000 census). It shares a school with the nearby community of Kavulik. The *tambu area* created by the community lies to the north of the village and it starts at the high water mark and extends out over the reef to a distance of approximately 200 m. It starts with an extensive lagoon that is revealed at low tide, patches of sea grass, to coral reefs close to the lagoon edge. There is an extensive mangrove area around the island however it is not included in the *tambu area*. The ecosystem is still intact but there are signs of over harvesting of certain marine resources. The main reasons for establishing a *tambu* area here was to ensure food security, to improve reef health, to support the establishment of small-scale fishing, to serve as model site, and to improve knowledge about their marine resources.

3. Methodology

The first training workshop was conducted in Kaselok Village outside of Kavieng at the Ranguva Solwara Skul. The participants from four communities (Ungakum, Kavulik, Silom and Dabanot) used the guidance of the SEM-Pasifika manual (available through the SocMon website at www.socmon.org) to identify and articulate: 1) any relevant management objectives for the local

marine area, 2) assessment objectives and 3) the survey site area and indicators that would be used during the assessment training and data collection exercise. Participants from each community, alongside Provincial Fisheries Officers and under the guidance of the workshop leaders, designed data collection forms for key informant and household surveys (see Appendices). During the second training workshop in Ungakum, a subset of the original participants along with some newly identified participants collected data within the Ungakum community setting. Data forms were returned to the trainers and entered for analyses. The information was summarized and analyzed by workshop trainers and participants. During the data entry phase, a number of issues with the survey design and questions became apparent. This field component was repeated and improved upon during the workshop conducted in Dabanot. Based on their experiences during the Ungakum workshop, participants from Dabanot and Silom were able to critically assess the questions as posed within their original survey design and decided to improve their survey questions to better match their interests and clarify the questions. They also went through the exercise of translating the questions into Tok Pisin to help with elaborating on the questions during data gathering. In addition to redesigning the survey questions and conducting the survey, trainers of the third workshop focused more on teaching data analyses and presentation of the results to the communities than the previous workshop. Through this process, participants and WCS staff were able to learn from and improve upon the training with each visit to a new community. An additional round of improvements to the surveys have been made and the trainers and some of the participants have decided that it would be valuable to develop a single Household Survey Form and single Key Informant Survey form to be used in all four target communities in subsequent survey efforts. We hope for these to be used by the trained monitors from Kavulik and Ungakum to survey Kavulik community members in the months to come.

This report summarizes the process and findings generated by the newly trained socio-economic monitors' work in Ungakum Village. Another report summarizes the same for Dabanot and Silom Villages.

Assessment Goal

The goal of the socio-economic assessment and overall monitoring activities is to train local community members in some of the assessment approaches they can use to study their own communities and community needs. A subset of these community members will become "Community Socio-Economic Monitors". Ultimately, the surveys aim to provide the resident community, decision makers, and interested stakeholders with information useful for better understanding local conditions and the impact of resource management activities on the lives of community members. It is hoped that greater community and stakeholder understanding of local conditions and impact of management activities will lead to greater support for present and future locally managed marine areas as an approach to safeguarding marine resources for the benefit of present and future generations. The use of local community socio-economic monitors will enable the community to take ownership and responsibility for the sustainable use and management of their natural resources.

Site Management Goal and Objectives

The primary coastal concern of local residents and managers is the maintenance of marine resources within nearby fishing grounds. The management goal of the Ungakum Locally Managed Marine Area as formulated by workshop participants was stated as: "*Ungakum bai mas gat inap marin risos bilong ol pikinini bilong bihain taim.*" (Ungakum needs to have sufficient marine resources to support its future generations.) The specific objective was stated as: "*Long 2015, ol sais na ol namba bilong ol marin risos bai imas kamap bikpla no planti bilong alivim laip na sindaun bilong ol pikinini bliong biahain taim.*" (By 2015, the size and abundance of marine resources will have increased to sustain the livelihoods of future generations.)

Assessment Objectives

The specific objectives of this socio-economic assessment include the following:

Objective 1: Train local community members in the value and approaches used for socio-economic surveying. Empower local communities to utilize socio-economic tools.

Objective 2: Assess the level of dependence of Ungakum community members on marine resources.

Objective 3: *Kisim tingting bilong ol manmeri bilong ples long wanem taim bilong opim tambu eria na bilong wanem as na bai mipla opim.* (Gauge the views of community members on when the no-take closure should be reopened and for what reasons.)

Assessment Indicators

Given the site management goals, and assessment objectives, the following assessment indicators from the SEM-Pasifika Guide (with manual identifier codes in brackets) were selected by the Ungakum workshop participants, with advice and guidance from the PNGCLMA workshop facilitators. Asterisks mark indicators that were not specifically identified by participants but were, nevertheless, included within the surveys.

Table 1. Household indicators incorporated into Household Surveys conducted in Ungakum Village

1.	Age [D4]
2.	Marital Status [D5] *
3.	Sex [D6]
4.	Education And Literacy [D7]
5.	Ethnicity/Clan [D8]
6.	Religion [D9]
7.	Occupation [D11]
8.	Sources Of Household Income [D12]
9.	Material Style Of Life/Household Economic Status [D13]

Table 2. Key Informant indicators incorporated into Key Informant Surveys conducted in Ungakum Village

1.	Number and profile of visitor [D2]
2.	Coastal And Marine Activities [C1]
3.	Coastal And Marine Goods And Services [C2]
4.	Harvesting Methods [C3] *
5.	Dependence on coastal and marine resources [C5]
6.	Types and levels of use by outsiders [C6]
7.	Monetary value of goods and services [C7]
8.	Market Of Coastal And Marine Goods And Services [C8]
9.	Gender Roles And Responsibilities In Coastal And Marine Activities [C9]
10.	Stakeholder Participation in Management [ST2]

Data collecting methods

Following the development of the assessment plan, indicators list, and survey instruments, the households to be surveyed were randomly selected. The surveys were conducted over a few days to suit the daily routine of the members of those households selected. Where possible, prior notice was given to members of the households. The participants were divided into four groups of three to four people each with a facilitator/trainer. Forty-one households were surveyed and a total of eight key informants were interviewed..

4. Results

Findings for the selected indicators from household survey and key informant interviews are provided by topic below.

Household Survey Results

1) Population Size, Number of Households, and Household Size [D1]

Within Ungakum Village, 41 of a total of about 105 households were surveyed. Within this sample, the assessment counted a total of 205 people yielding an average of roughly five people per household in the area. From this, we can estimate a total population of 525 people. This is more than double that of the 2000 census which counted 245 people in Ungakum.

2) Age [D4]

A majority of the sample (18.5%) are young infants in the 0-5 age group. The next most common age bracket in Ungakum is 26-30 years old (Table 3). The average age is 25 years.

Table 3. Distribution of age categories within the Ungakum community

Age Groups	Count	%
0-5	38	18.5
6-10	24	11.7
11-15	22	10.7
16-20	14	6.8
21-25	14	6.8
26-30	26	12.7
31-35	14	6.8
36-40	9	4.4
41-45	9	4.4
46-50	6	2.9
51-55	8	3.9
56-60	9	4.4
over 60	10	4.9
Don't know	3	1.0
Total	205	100

3) Marital Status [D5]

The distribution of marital status within the surveyed population is shown in Table 4. The majority of Ungakum's adult residents over 16 years of age (73%) are married and 23% are single.

Table 4. Distribution of marital status within the Ungakum community

Marital Status	Count	%
Married	87	73.1
Single	27	22.7
Divorced	1	0.8
Widowed	4	3.4
Total	119	100

4) Gender (Sex) [D6]

The sample had a nearly even gender distribution of 47% females and 53% males.

Table 5. Gender breakdown

Gender	%
Male	53
Female	47
Total	100

5) Education and Literacy [D7]

Of the 205 people surveyed through the Household Surveys, 120 were over the age of 16 and included in the Education analyses. The greatest proportion of adults (73%) in Ungakum have had 6 to 10 years of formal education (Table 6).

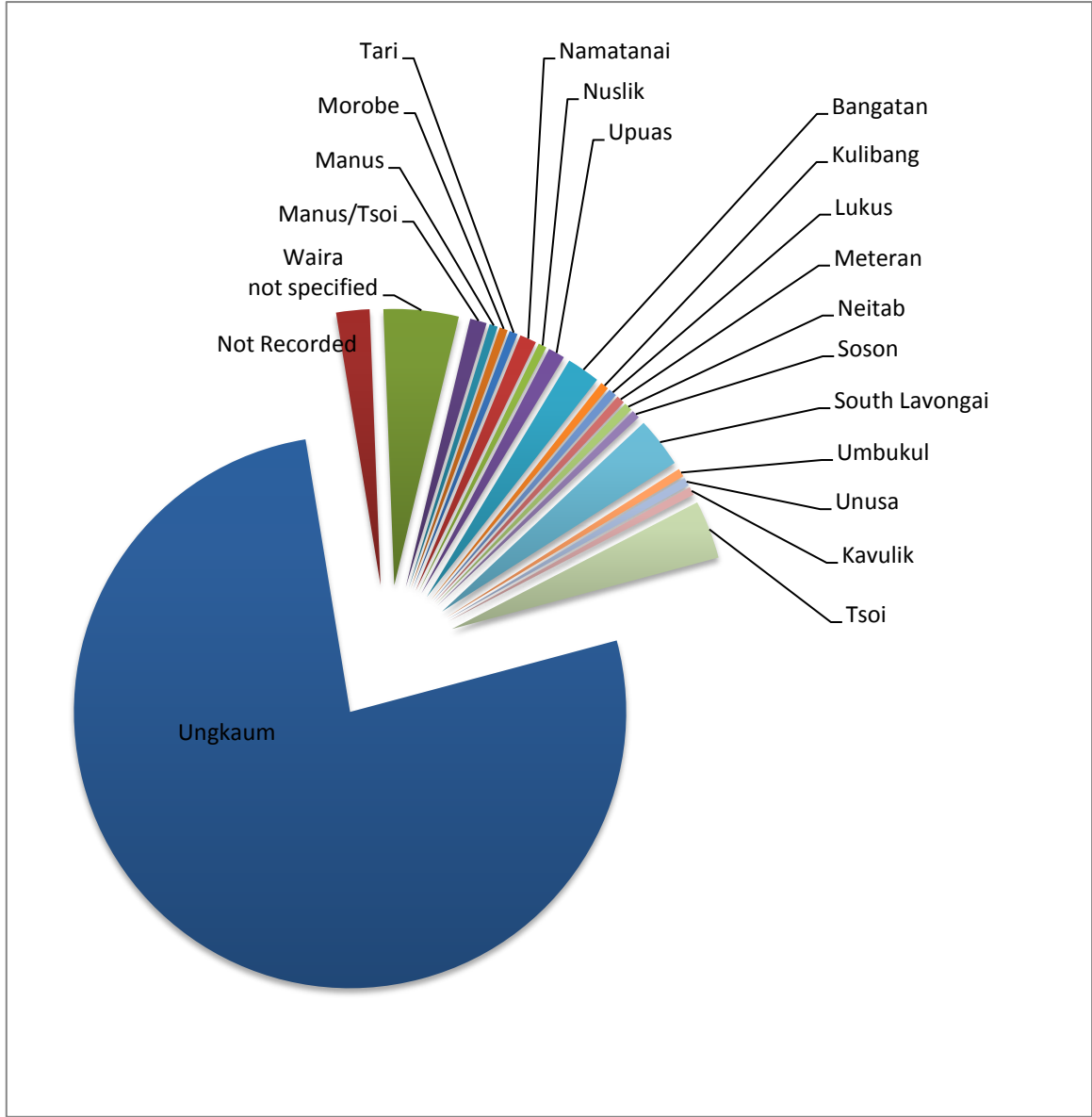
Table 6. Formal education breakdown

Years of Education	Count	%
Not Recorded	1	0.8
No Formal Education	6	5.0
1-5 Years	17	14.2
6-10 Years	88	73.3
11+ Years	8	6.7
Total	120	100

6) Ethnicity / Clan [D8]

Broadly, ethnicity within the survey population was uniformly comprised 100% of Melanesian Pacific Islanders indigenous to Papua New Guinea. To further classify individuals, the assessment team collected information on categories closely related to cultural group through village or island of origin. Taking into account these additional classifications, the Ungakum household survey population is comprised of 19 groups. In some cases, the subjects simply identified themselves as being *waira* (an outsider to Ungakum) (4.4%) and some data was not collected for four (2.0%) of the 205 people. Of the remaining, 76.6% identified themselves as from Ungakum, 12.2% from within the Lavongai LLG, 2.4% from New Ireland communities outside Lavongai LLG, and 2.4% from provinces other than New Ireland Province.

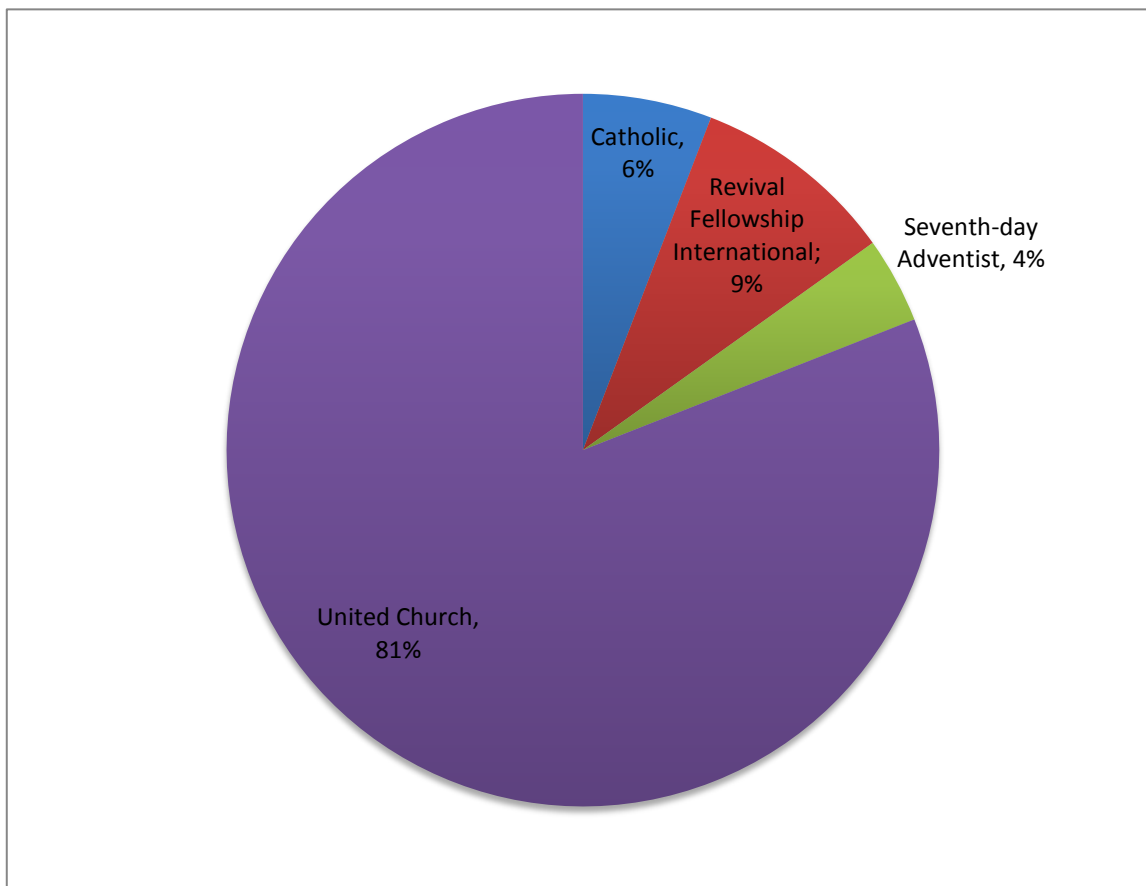
Figure 1. Origin of people within Ungakum community



7) Religion [D9]

The majority of the respondents belonged to the United Church (81%), followed by Revival Fellowship International (9%), the Catholic Church (6%), and Seventh-day Adventist (4%) (Figure 2).

Figure 2. Christian denominations within Ungakum

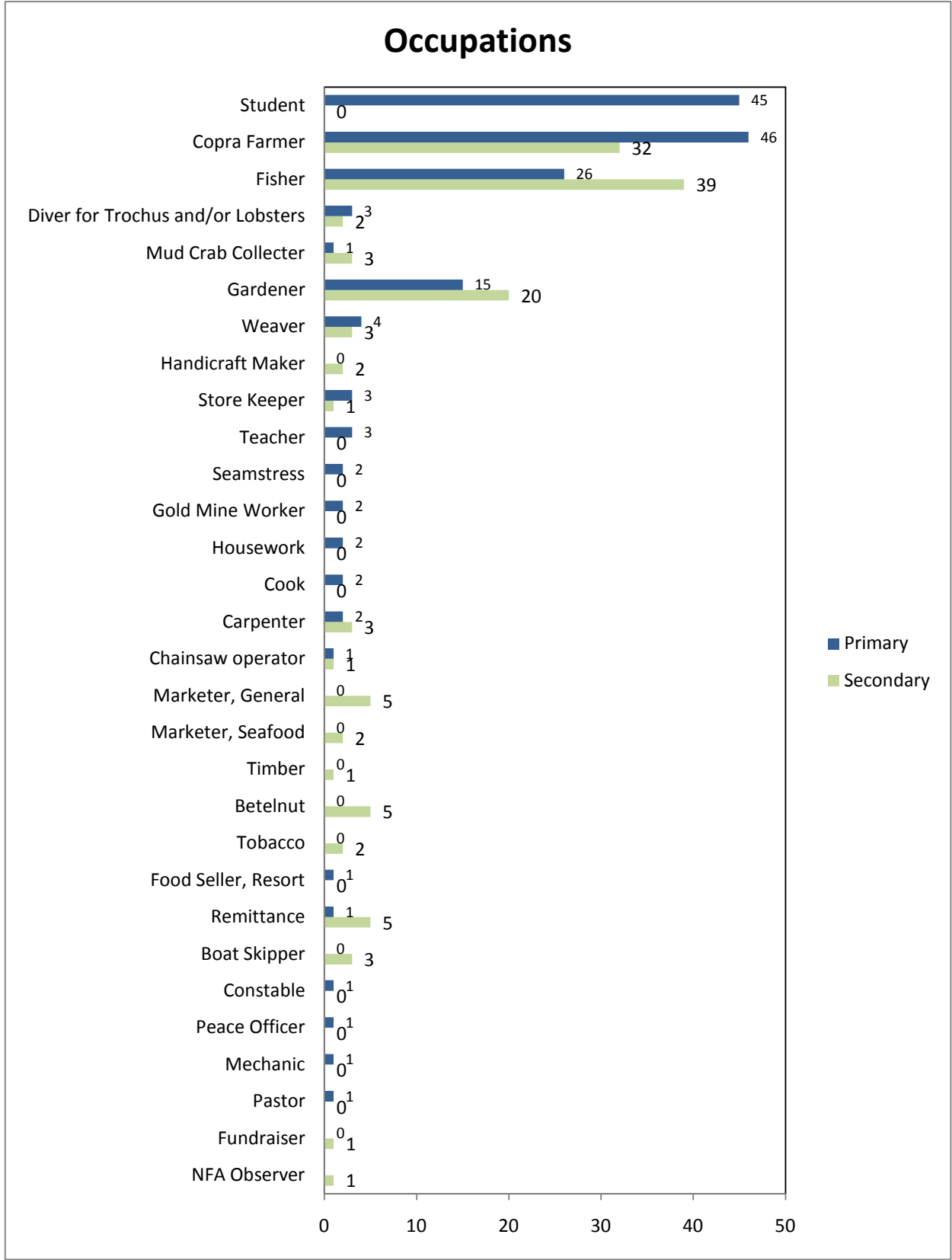


8) Occupation [D11]

Children not of school age were not included in the Occupation analyses. Respondents were asked their primary occupation and, if applicable, secondary occupations. In cases where respondents listed two secondary occupations, these were not ranked into secondary and tertiary but all included as secondary occupations.

Ungakum community members have a wide variety of occupations; they identified 30 separate occupations. The majority of community members similarly identify themselves primarily as copra farmers and students (28.2 and 27.6%, respectively). Fisher (16.0% and 29.8%) is common as both a primary and secondary occupation (Figure 3).

Figure 3. Primary and secondary occupations in Ungakum Village

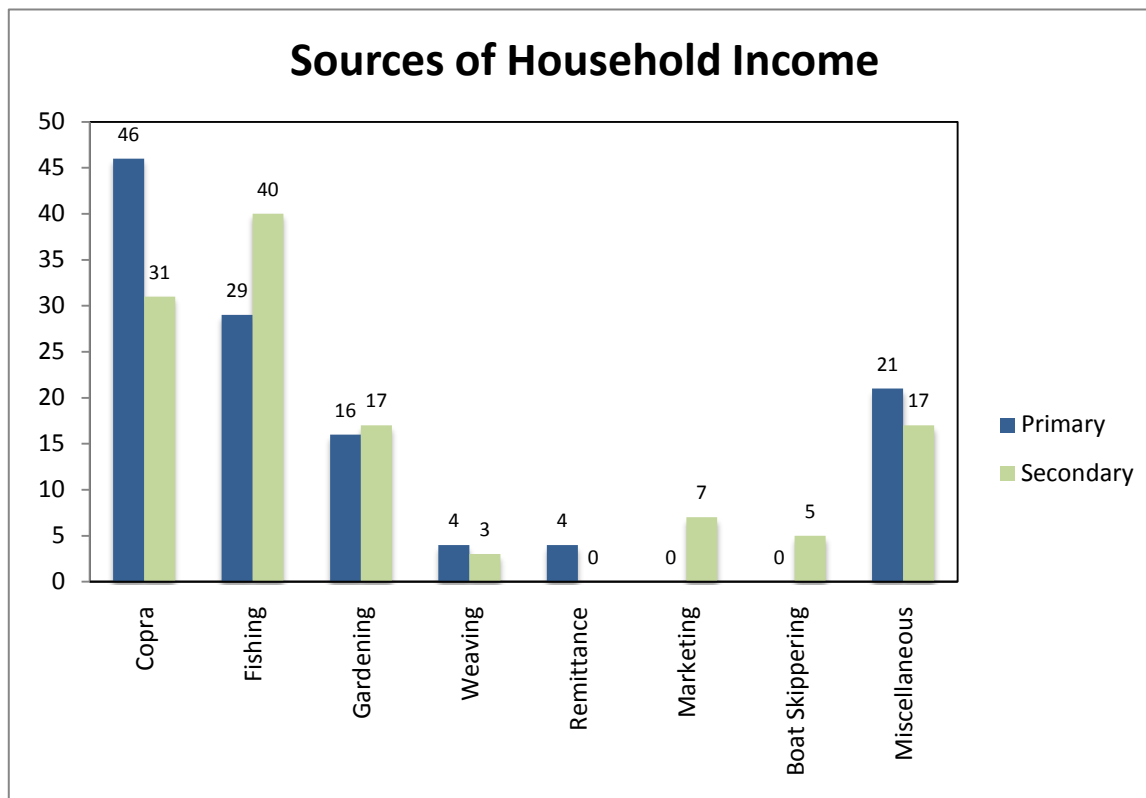


9) Sources of Household Income [D12]

In line with data collected on occupation, Ungakum community members' main source of income is from copra (38% of primary and 26% of secondary sources of income). Fishing is important for 24% of respondents as a primary source of income and is most important as a secondary source of income (33%).

In the revised survey, we have expanded on this question; it now asks for all activities people are involved in to bring in food and money and asks them to also rank them in order of importance. This incorporates what was covered by the original D11 question, above but restricts the options. A new second component to the question asks about household expenses asking for an average of what each household may have spent over the last fortnight. We realize the sensitivity of this question but have left it there to be asked where the situation allows.

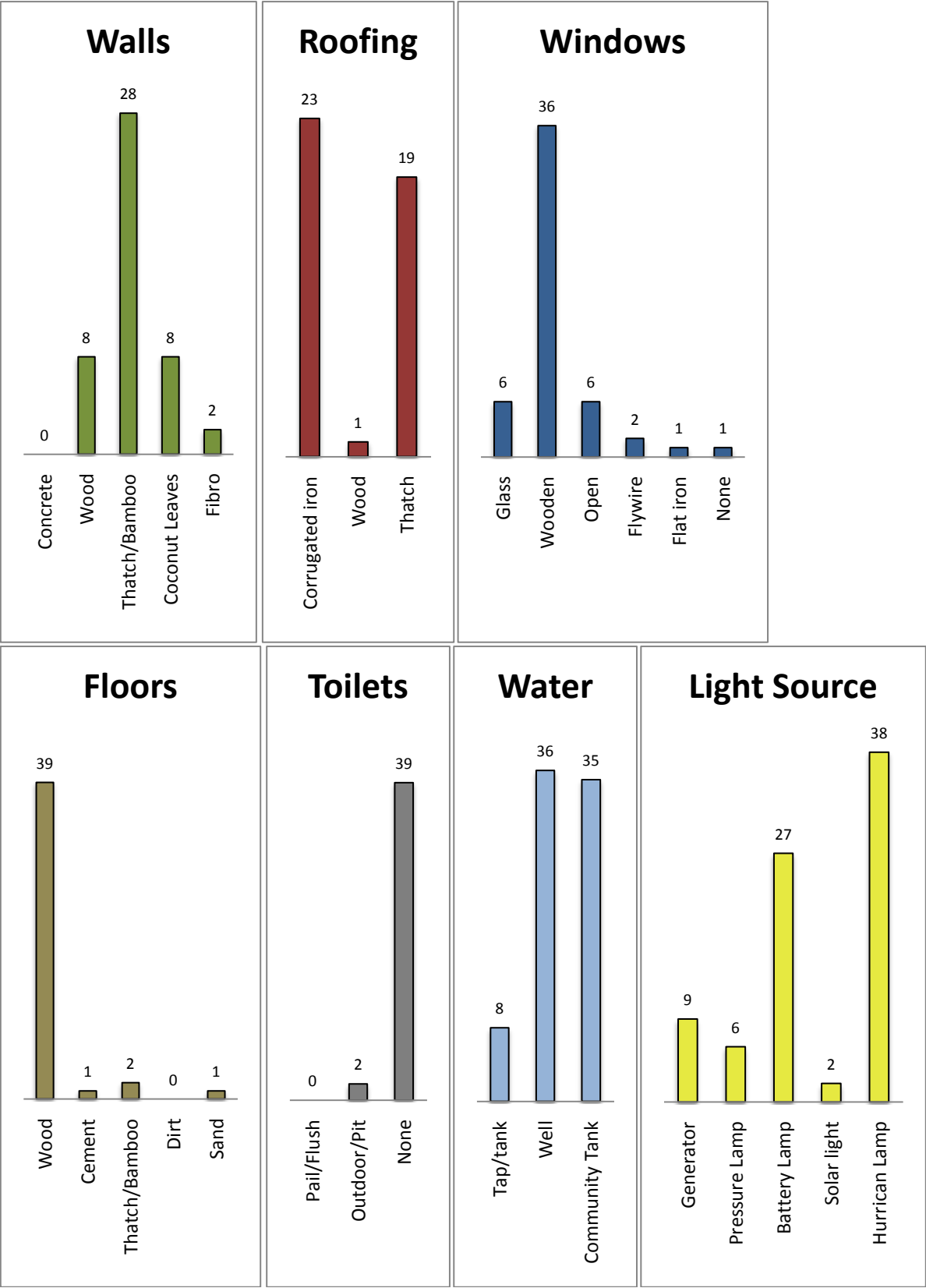
Figure 4. Primary and secondary sources of income in Ungakum Village



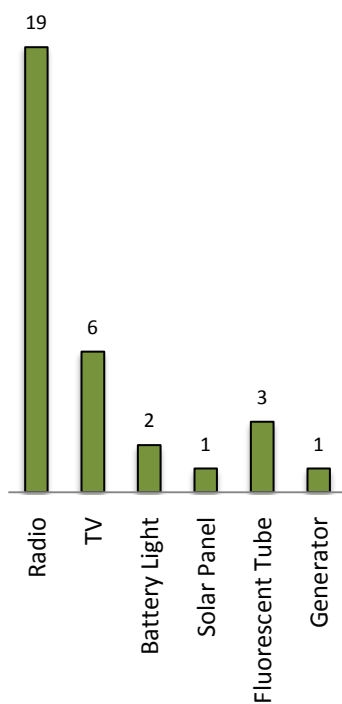
10) Material Style of Life/Household Economic Status [D13]

For the indicator Material Style of Life and Household Economic Status, observations of each home's characteristics were made by the monitors. An account of these observations are summarized in Figure 5. A majority of the houses in Ungakum are semi-permanent with wooden floors, thatch/bamboo walls, and corrugated iron roofs and use hurricane lamps for lighting. Most houses do not have sanitation facilities and water is generally collected from wells and shared community water tanks. Most of the community members do not own expensive items. The most commonly owned appliances and productive assets are radios and canoes.

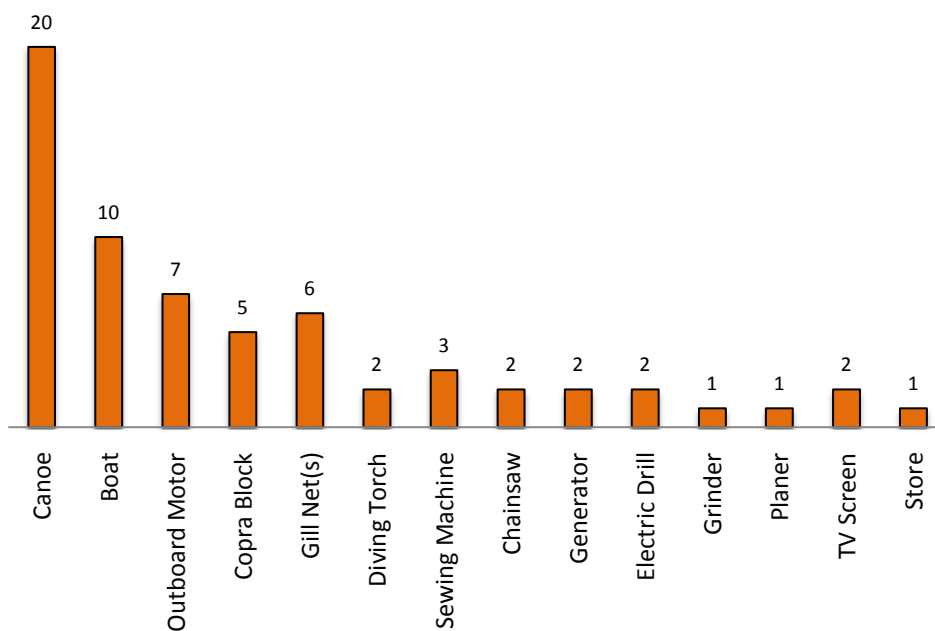
Figure 5. Household material goods and productive assets, Ungakum Village



Appliances



Productive Assets



Key Informant Information

Trainers and the trainee monitors identified ten key informants in Ungakum to administer the Key Informant survey to. Eight of these were completed for the following key informants: Church Representative, Women's Group Representative, Village Planning Committee Chairman, Fisherman, Law and Order Officer, Locally Managed Marine Area Coordinator, Community Monitor, and Socio-Economic Monitor. In all analyses presented, the sample size was therefore eight respondents.

1) Number and Profile of Visitors [D1]

Key informants identified 12 different visitors to their community over the last year (Table 7). These samples are undoubtedly biased by the nature of specialty of the key informant. For example, the Church Representative reported the visitors that related to the church and no other community visits; The Women's Representative reported visitors relating to Women's Fellowship.

Among the visitors, the Wildlife Conservation Society was reported by the most key informants. This is also of obvious bias since WCS was in the community at the time helping with the training and administration of this particular survey. Perhaps most surprising is that not every key informant thought to include the NGOs (WCS and PNG CLMA) which were in its community at the time. This further emphasizes that the informants (perhaps with the monitors' encouragement) tended to report visitors specific to their line of expertise. The counts of visitors is, therefore, not possible to interpret. The average number of visits reported in Table x is the average of visits reported across only those key informants who reported visits by that interest group or person. For example, of the five key informants who reported visits by WCS, the estimate of number of visits ranged from 2 to 5 with an average of 2.8. Of interest to WCS is that we have visited the community many more times over the past year but the informants appear to only count those visits when the organization stayed in the community for multiple days. Perhaps this reflects an increased value placed on visits that last multiple days.

Table 7. Visitors to Ungakum over the last year as reported by Key Informants

Type of Visitor	Purpose of Visit	Number of KI Who Reported Visit	Average Number of Visits per Year over KIs Who Reported
Wildlife Conservation Society	Trainings, Biological Monitoring	5	2.8
Health Extension Officer	Clinic and Awareness	4	1.5
Government Officer	Awareness	2	1
School Inspector	School Inspection	2	1
Village Court Representative	Full Court Sitting	1	6
Women's Circuit Executive	Women's Fellowship Work	1	4
Marama	Help with Spiritual Side of Women's Fellowship	1	4
Church Representatives	Church Meetings	1	4
Head Pastor	Inspect Work of Pastor	1	4
Reverend	Visit to Church	1	4
Chief Legal Officer	Check Monthly Law and Order Reports	1	1
Village Court Coordinator	Inspect Village Court and Conduct Workshop	1	1

2) Coastal and Marine Activities [C1], Goods and Services [C2], Harvesting Methods [C3]

Through administering the surveys during the second workshop, it became apparent that the original Ungakum Key Informant survey format was poorly designed for data collection and for analyses in terms of relating values for indicators C2 and C3 to indicator C1. The survey format was redesigned by workshop participants during the third workshop in Dabanot. Though, from the surveys, we can say that two marine activities that were identified were fishing and bathing and informants target a

range of marine species, specifically fin fish, trochus, crabs, crayfish, shells, clams, kina shells, *longtail* (a mangrove shellfish), and octopus.

3) Proportion of Dependency [C5]

Table 8 lists the proportion of dependency on various coastal and marine goods and services as estimated by key informants for their own consumption versus generating income.

This question caused some confusion among respondents for two categories. Both ‘swimming’ and ‘waste disposal’ should have a 0% sale value since 100% of these particular activities would be for personal ‘consumption’; it did not make sense for these activities to be included in this way in this question. However most informants did give a percentage other than 100 for percent own consumption. This percentage likely reflects the degree of importance that the activity and service is seen to have within these people’s lives but there is no way to be sure how the question was interpreted. Therefore these two activities are not analyzed here. Also, mangroves provide multiple goods and services and these could have been split in order to assess the proportion of dependency for each service. For example, it is possible that firewood from mangroves could have been weighted more toward “own consumption” while mangrove crabs may be caught primarily for sale over own consumption. This type of information could be useful for management planning. The question structure was redesigned during the Dabanot workshop to address many of these concerns, including linking it to C1 and C2 to allow community members to identify the services themselves and then rank them.

For each goods and service examined, the key informants ranked home consumption having greater importance overall than income generation. Fishing for reef fish was just about evenly split which suggests that the sale of reef fish may be the most important marine-related service for income generation in Ungakum. The responses around the tourism service of providing seafood are puzzling since one would expect services around tourism to be entirely for income generation. This identifies a possible problem with the survey design and the interpretation of the question.

Table 8. Proportion of dependency of coastal and marine goods and services

Coastal/Marine Activity	Goods and Services	% Own consumption Average (Range)	% Income generating Average (Range)
Fishing	Reef fish	51 (20 – 90)	49 (10 – 80)
Fishing	Shell fish	73 (30 – 95)	27 (5 – 70)
Tourism	Provision of Sea Food	53 (20 – 90)	47 (10 – 80)
Sea Transport	Transportation	65 (50 – 100)	35 (0 – 50)
Mangroves	Building Materials, Firewood, Collecting Shells, Collecting Crabs	79 (50 – 95)	21 (5 – 50)

4) Types and Level of Use by Outsiders [C6]

According to the key informant surveys, outsiders tend not to fish Ungakum’s reefs and deep sea areas but do buy wood cut from mangroves (Table 9). These findings will be presented to the community and asked for confirmation.

Table 9. Use of particular marine resources by outsiders to Ungakum

Resource	Level of Use by Outsiders		
	Low	Medium	High
Catching Fish through Trolling	5	3	0
Deep Sea Fishing using Dorries	6	2	0
Building Materials from Mangroves	0	1	7

5) Monetary Value of Goods and Services [C7]

According to the key informant surveys, reef fish generate high monetary rewards (Table 10). Beche-de-mer was ranked lower than reef fish. Currently there is a nation-wide ban on harvesting beche-de-mer and it is unclear whether this question was interpreted by respondents as the *current* value of the beche-de-mer industry (which would be low) or the value of the catch when operational.

Table 10. Monetary value of goods and services

Resource	Monetary Value		
	Low	Medium	High
Reef Fish	0	4	4
Beche-de-mer	4	2	2
Provision of Food through Tourism	4	3	1

6) Market of Coastal and Marine Goods and Services [C8]

Informants were asked to break down, into percentages, proportions of how much of the marine goods and services served international, national, and local markets. Table 11 presents the average percentage across the respondents and the range in percentages they offered for each. The original question included hotel development and recreational fishing but these are not applicable to Ungakum so they were not answered by many informants and not analyzed here. Coconut crabs was removed from the analyses as well since these crabs do not occur in Ungakum.

As ranked by the key informants, marine goods and services that serve primarily international markets are dive tourism and trochus shells, national markets are reef fish and lobsters, and local markets are octopus and shell fish. The Ungakum key informants have a clear understanding of how the goods and services from their marine environment serve people from different regions.

Table 11. Market distribution of coastal and marine goods and services

Goods and Services	% International	% National	% Local
Reef fish	0	56.7 (30 – 70)	43.3 (30 – 70)
Octopus	0	5.6 (0 – 20)	94.4 (80 – 100)
Diving	61.3 (10 – 80)	28.1 (15 – 40)	10.6 (0 – 50)
Shellfish	21.3 (0 – 60)	26.3 (0 – 50)	52.5 (5 – 100)
Lobster	40.6 (0 – 90)	47.5 (10 – 70)	11.9 (0 – 30)
Trochus	95 (80 – 100)	3.1 (0 – 10)	1.9 (0 – 10)

7) Gender Roles and Responsibilities in Coastal and Marine Activities [C9]

The survey table for this question was taken straight from the SEM-Pasifika manual but was not clearly understood by the monitors. Many of the surveys did not record the gender but, instead, only recorded whether the activity is conducted by adults or children. The chart needs a clear heading that forces monitors to ask and record gender. As such, this question could not generate a clear analysis.

8) Stakeholder Participation in Management [ST2]

All informants responded that they are involved in fishing, tourism, and mangrove harvesting. The question included “residential development” which is not relevant to Ungakum. The question as posed revealed little of interest. It was dramatically reworked during the Dabanot workshop to improve the questions around this indicator.

5. Conclusion and Recommendations

Conclusions

This was the first time for all of the socio-economic monitors to participate in socio-economic training and data collection. We consider this exercise’s primary result as the *training* of some local people to assess their own community’s condition through surveying as well as empowering them in conducting surveys and providing a sense of how such surveys could benefit their understanding of their own communities’ needs. Some of the questions were poorly designed and some data was not collected properly so not all can be used or interpreted with great confidence at this stage. However with more experience in conducting the surveys, we believe the community monitors could develop the necessary skills to conduct and analyze survey data in the future.

In both of the field training workshops, monitors were better able to conduct the Household surveys over the Key Informant surveys. The indicators within the Key Informant survey are more challenging questions, deal with more challenging concepts, and the formats and content as originally lifted from the SEM-Pasifika manual are not always applicable or easily understood within our communities. The second workshop and survey exercise within Ungakum acted much like a testing ground for questions and the training within Dabanot was an opportunity to hone the questions further. Unsurprisingly, still further survey tweaking was needed.

This was the first time these monitors have participated in an exercise like this Ungakum has a high percentage of community members who have received an education (73% have received between six and ten years of education) and many have the potential to carry out this activity well if given additional training and encouragement. Changes made to the survey forms in reaction to various lessons learned have allowed them to be improved so that they are better tailored to New Ireland’s communities and, hopefully, are easier to understand and administer. We are optimistic that Ungakum community monitors will be able to collect additional data that will provide confident data that can be analysed and interpreted by the community members themselves.

Recommendations

From the survey’s findings, it is recommended that:

(1) An Education and Awareness Program be developed and that would target the following issues or topics:

- Basic marine education on specific ecosystems and organisms (Corals, Seagrass, Fish, Sea cucumbers, etc.)
- Basic education on the impacts of trash in the marine environment (Plastic, Batteries, etc.)
- Impacts of destructive fishing on marine systems and resources
- Impacts on land based activities to marine ecosystem – cause and effect for both ecosystems.
- Principles of Management
- Benefits of management

- (2) Awareness programs should target students as well as adults since students make up a huge proportion of the communities' populations.
- (3) Findings from these surveys can be presented back to community members during upcoming meetings so that they can contribute to improving marine management plans to better address their needs and concerns.

Revised Surveys

Through this process, various edits have been identified to improve the survey forms for better and easier delivery of the questions for the monitors. It is a general consensus among the trainers and some of the participants that it would be valuable to develop a *single* Household Survey Form and *single* Key Informant Survey form to be used in all four target communities. This stems from three points:

- 1) The management objectives and assessment objectives are similar across all four communities.
- 2) Monitors from four different communities were involved and participated in surveys in communities other than their own. This has created a pool of trained monitors and allowed communities the opportunity to learn from one another. And created a small team of monitors who can work in communities other than their own to administer surveys. This would be easiest if surveys were the same across all the communities.
- 3) The same survey would allow between-community comparisons.

Revised Household and Key Informant surveys have been designed (see Appendix). These surveys will be distributed to trained monitors from Ungakum and Kavulik in order to encourage a stage four component to this project, namely for both surveys to be administered in Kavulik by trained monitors on their own. They will also be shared with monitors from Dabanot and Silom to allow them the opportunity to administer, in particular, the Key Informant survey in their communities.

6. Appendices

1. Workshop participants
2. Revised survey forms
3. Original survey forms

Appendix 1. Workshop participants

Participants of the SEM-Pasifika Workshop, May 18th – 21st, 2010 Kaselok, New Ireland

WCS PNG Marine Program Staff

Kate Holmes
Rachael Lahari
Tau Morove
Jane Wugen, intern

PNGCLMA Staff

Maxine Anjiga
Rebecca Samuel
Reuben Tuka

Provincial Fisheries Officers

Manaon Manilias, to assist with Ungakum Village, Tsoi Islands
Simeon Agar, to assist with Kavulik Village, Tsoi Islands
Leonard Jahat, to assist with Dabanot Village, Madak
Vaitas Lasaro, to assist with Silom Village, Madak
Elsie Pangogo, region of focus is Mussau Island, assisted with Kavulik Village

Kavulik Village Representatives

Noah Wepo (male)
Pokpokai Malavai (Priscilla) (female)
Marioth Delvin (female)

Ungakum Village Representatives

Elison Watlom (male)
Pedri Pesat (female)
Perry Misiel (male)
Kalina Jackson (female)
Jackson Solo (male)

Silom Village Representatives

Steven Thomas Maves (male), Village Planning Committee Chairman
Winnie Robert (female)

Dabanot Vilage Representatives

Bulake Mai (male)
John Sibe (male)

**Participants of the SEM-Pasifika Workshop, February 28th to March 5th, 2011
Ungakum, New Ireland**

WCS PNG Marine Program Staff

Modi Pontio
Jane Wia
Tau Morove
Jasmine Duadak

PNGCLMA Staff

Rebecca Samuel
Reuben Tuka

Provincial Fisheries Officers

Simeon Agar, assisted with Kavulik Village, Tsoi Islands
Vaitas Lasaro, assisted with Silom Village, Madak

Kavulik Village Representatives

Marioth Delvin (female)
Ranga Kot (male)

Ungakum Village Representatives

Elison Watlom (male)
Pedri Pesat (female)
Perry Misiel (male)
Kalina Jackson (female)
Jackson Solo (male)
Charlie Nelson (male)
Robinson Lisah (male)

Madak Villages Representative

Mena Romus (female)

**Participants of the SEM-Pasifika Workshop, March 28th March - 02 April 2011
Dabanot, New Ireland**

WCS PNG Marine Program Staff

Modi Pontio

Jane Wia

Tau Morove

Kavulik Village Representatives

Marioth Delvin (female)

Ranga Kot (male)

Ungakum Village Representatives

Jackon Solo (male)

Perry Misiel (male)

Silom Village Representatives

Agesta Daniel (female)

Elsa Semmy (female)

Daniel Apau (male)

Dabanot Village Representatives

Mena Romus (female)

Penius Lemele (male)

John Tengi (male) (observer for a day)

Appendix 2. Revised survey forms

Household Survey Form

Site Peles: _____

Name of Respondent - *Nem blo husait man/meri i bekim ol askim:* _____

Date - Det: _____

Name of Interviewer - *Nem blo husait man/meri i wokim ol askim:* _____

No.	Name	D4. Age	D6. Sex (F/M)	D7. Years of formal education	Clan name	Place of origin (this Community, LLG, District, Province, other Province).	How long have you lived here in years	What was your reason for coming to this community	D9. Denomination	D11. Occupation <i>Wanem kain ol wok u na ol haus lain blo u isave wokim long kisim moni o kaikai ikam insait long femili o haus?</i>	
	<i>Nem blo ol haus lain</i>	<i>Krismas bilong olgeta haus lain</i>	<i>Man o meri</i>	<i>Pinisim skul lo wanem graid</i>	<i>Nem bilong klan bilong u</i>	<i>Yu blong we? Dispela komuniti, dispel LLG, dispela distrik, dispela provins o narapela provins?</i>	<i>Hamas yia u bin stap pinis long dispela ples?</i>	<i>Bilong wanem as u kam stap long hia?</i>	<i>Wanem lotu bilong u?</i>	Primary <i>Nambawan wok</i>	Secondary <i>Namba tu samting</i>
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

D12(a). How do you get food or money to support you and your household?

Wanem ol wok u na ol narapela haus lain bilong u save mekim long kisim moni na kaikai ikam insait long famili/haus?

Activity	Mark the activities your family does	Who does this work (men, women, children)?	How many people engage in the activity?	Rank each marked activity in order of importance from the most to the least important starting with 1 = Most Important.
Wok	<i>Makim ol wok we haus lain i wokim</i>	<i>Husait i mekim (man, meri, pikinini)?</i>	<i>Hamas man o meri i mekim dispel wok (#)?</i>	<i>Makim wanem em impotent igo inap long wanem em ino impotan. 1 = impoten antap.</i>
Fishing <i>Painim pis</i>				
Gleaning <i>Kisim sel/urita</i>				
Commercial fishing <i>Baim/salim pis/pislama/lalai/gramsel na ol narapela samtin bilong solwara</i>				
Gardening <i>Wok gaden</i>				
Cocoa and copra <i>Wok kakao/kopra</i>				
Employed <i>Wok fotnit</i>				
Payment from tourism related work <i>Wok turis</i>				
Market sales <i>Salim ol kaikai na ol narapela samtin long kisin moni (haus maket)</i>				
Remittance <i>Ol narapela samtim olsem kisim halivin long ol family i wok long ofis</i>				
Hunting <i>Painim welabus</i>				
Sale of timber <i>Liklik wok forestry (sawmill)</i>				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				

D12(b). How much money did you and your family use in the last two weeks? (circle one)

Hamas moni u wantaim femili ibin usim long tupela wik igo pinis? Makim wanpela:

K0 – K20	K20 – K50	K50 – K100	K100 – K200	K200+	No answer
----------	-----------	------------	-------------	-------	-----------

C1. Coastal and Marine Activities <i>Wanem ol wok ol lain lo ples i save wokim lo nambis na solwara.</i>	C2. Goods and Services <i>Wanem ol samtin ol lain lo ples isave kisim long dispela wok.</i>	C5. Proportion of dependency	
		% own consumption <i>Hamaspla yupla yet kaikai</i>	% sale <i>Hamaspla blo salim</i>

C10. Knowledge of Coastal and Marine Resources

Bilong wanwan statmen,(or tokaut?) makim sipos u tingim se em i tok tru or tok giaman. (✓)

Coastal & Marine resource knowledge statements	True <i>Tok tru</i>	False <i>Tok giaman</i>
Coral is a living animal. <i>Korol I animol we igat laip.</i>		
Seagrass provide habitat for baby fish. <i>Sigras em hap blong ol liklik pis lo stap na kaikai.</i>		
Breaking corals to catch octopus is not destructive to the reef. <i>Burukim korol lo kisim urita ino bai bagarapim rip.</i>		
The tambu area will contribute to increase the supply of fish in the whole area. <i>Tambu aria bai halivim long saplaim ol pis long olgeta hap rip insait long peles.</i>		
Coral bleaching is a sign of healthy reefs. <i>Taim kala blong korol i tanim igo wait em soim olsem korol i stap gut.</i>		
Breaking of live corals for lime production is a sustainable income generating activity. <i>Pasin blong burukim korol blong wokim kambang emi gutpla blong lukaut blong ripKambang ston bai stap yet lo solwara blong ol man meri lo go kisim na wokim kambang blo salim.</i>		

C11. Attitudes toward Coastal & Marine Resources

Bilong wanwan tokaut, makim sipos em i wanbel stret, wanbel, no save, ino wanbel. o ino wanbel stret waintaim tokaut. (√)

	1	2	3	4	5
Attitude statements	Strongly Agree Wanbel stret	Agree Wanbel	Neither No save	Disagree Ino wanbel	Strongly Disagree Ino wanbel stret
I would vote for a tambu area near my village. <i>Sapos ol ibin askim tingting blo mi, bai mi tok orait lo putim tambu aria lo ples blo mi.</i>					
It is important that all community members look after the reefs. <i>Olgeta lain long peles mas lukautim gut hap solwara na rip blong yumi.</i>					
My family's health and well-being is linked to the health of our marine habitats. <i>Gutpla sindaun blo femili blo mi i pas wantem gutpla blong rip na solwara.</i>					
It is an important part of our culture to have a healthy marine environment. <i>Em bikpla samting insait long pasin kastom blo mipla long gat gutpla solwara.</i>					
The sea as a good place to dispose of rubbish from the village. <i>Solwara i gutpla hap long toromoi ol pipia.</i>					

C12. Non- Market and Non-Use Value

Bilong wanwan tokaut, makim sipos em i wanbel stret, wanbel, no save, ino wanbel. o ino wanbel stret waintaim tokaut.. (√)

	1	2	3	4	5
Non-market Non-Use Value Statements	Strongly Agree <i>Wanbel stret</i>	Agree <i>Wanbel</i>	Neither <i>No save</i>	Disagree <i>Ino wanbel</i>	Strongly Disagree <i>Ino wanbel stret</i>
The reefs are important for protecting land from storm waves <i>Wanpla wok we rip isave wokim em lo pasim si lon kam antap na bagarapim nambis na giraun.</i>					
Tambu areas should be restricted to those areas where no one goes fishing <i>Putim tambu aria long hap we ol man ino save go painim pis long em.</i>					
Coral reefs are only important if you fish or dive <i>Ol we isave go galas na painim pis tasol bai tingting planti long ol korol rip i gutpla samting long husait isave go galas o huk.</i>					
An important role the sea plays is to remove waste from our beaches <i>Wanpla bikpla wok solwara isave wokim em lo rausim pipia blo yumi.</i>					
Seagrass beds have no value to people <i>Sigaras i garas nating na nogat wok blong ol.</i>					
When coral reefs are protected, we will have enough food for our families. <i>Taim yumi lukautim korol rip yumi bai gat inap kaikai bilong femili.</i>					
One of the benefits of having a tambu area is to maintain the natural environment for future generations. <i>Wanpela gutpela samting blong kamapim ol tambu aria em long lukautim gutpla peles blong mipela blong nau na bihain taim.</i>					

T2. Perceived Resource Condition

How would you describe the current condition of each of the following resources?

Nau lo displa taim, long skelim blong u, u ting ol displa risos istap olsem wanem? (✓)

	Very Good (1) <i>Gutpela tru</i>	Good (2) <i>Gutpela</i>	Don't know (3) <i>No save</i>	Bad (4) <i>Nogut</i>	Very bad/poor (5) <i>Strongly nogut tru</i>
Coral reefs <i>Korol rip</i>					
Fresh water <i>Fres wara</i>					
Upland forest <i>Bus</i>					
Seagrass <i>Sigras</i>					

T3. Perceived Threats to Coastal and Marine Resources

What do you think are the major threats to coastal and marine resources?

Lo tingting blo u, wanem ol samting u ting iken bagarapim ol samting lo solwara na nambis? (✓)

(a) Threats from community activities

List up to five COMMUNITY ACTIVITIES happening in your community that threaten your marine resources <i>Namim five pela wok ol komunitu i mekim we iken bagarapim solwara bilong u</i>	High <i>Antap</i>	Medium <i>Namei</i>	Low <i>Tamblo</i>	Type of impact <i>Wanem bagarap iken kamapim</i>

(b) Threats from major development activities

List up to five big DEVELOPMENT ACTIVITIES happening in your community that threaten your marine resources <i>Namin five pela bigpela wok ikamap lon komuniti bilong u we iken bagarapim solwara bilong u.</i>	High <i>Antap</i>	Medium <i>Namei</i>	Low <i>Tamblo</i>	Type of impact <i>Wamen bagarap iken kamapim</i>

M11. Awareness of Rules and Regulations

Activities	Rules exist (Y/N)
Fishing (In tambu area) <i>Painim pis lo tambu eria</i>	
Use of derris root <i>Usim ol bun rop</i>	
Breaking corals <i>Burukim haus blo pis</i>	
Walking in tambu area (during low tide) <i>Wokabaut antap lo tambu eria lo taim blo drai rip</i>	
Fishing at night (spear gun) <i>Painim pis long nait</i>	
Use of gill nets with mesh size < 2.5 inches (National Fisheries Authority) <i>Usim bung aninit long 2.5 ins</i>	
Closure of beche-de-mer fisheries (National Fisheries Authority) <i>Lo paism ol lain lo kisim pislama we ibin kamap lo 2010 na bai igo inap 2013</i>	

C13. Alternative & Supplementary livelihoods

- a. What income generating activities did you or any other members of your household engage in the last 5 years?

*Long faivpla yia igo pinis, wanem kain ol narapla rot u o hauslain blo u bin kisim moni lo em?
(samting we u no wokim nau)*

- b. Why did you stop these activities? And do you think you could do any of them again?

Bilong wanem u lusim ol displa wok? U ting u bai inap wokim ol sampla blong ol gen?

D13. Household material (circle)

Ol samting bilong wokim haus (makim wanwan ol igat):

Roof:	Iron roof	Thatched sago leaf	Kunai/grass roof	Narapela: _____		
Outside walls:	Coconut leaf	Sago leaf	Sago fronds	Bamboo	Fibro	Timber
Windows:	Louvers/ Glass	Timber shutters	Curtains	No window cover	Narapela: _____	
Floor:	Graun/ Sand	Sago fronds	Black palm	Timber	Cement	Narapela: _____
Toilet:	Pit toilet	Flush toilet	No toilet	Narapela: _____		
Water:	Tap/piped	Water well	River	Tank water	Narapela: _____	
Light Lait:	Botol tin lamp	Candle – kendol	Hurricane lamp	Pressure lamp	Generator	Narapela: _____

Household furnishings - Handmade (H) or bought in shop (B)

*Makem **H** (Wokim long han) o **B** (Baim long stoa) long wanwan bilong ol samting igat long dispela haus. U ken adim moa.*

Chairs ()	Cupboard ()	Table ()	Shelves ()	Bed ()	Mattress ()	_____ ()
------------	--------------	-----------	-------------	---------	--------------	-----------

Home appliances (circle)

Ol samting long haus (makim wanwan ol igat)

VCD/DVD player	Generator	Bartri long car	Sola powa	Sewing machine	Torch	Clock
Fan	Fridge	Radio/cassette player/bum box	Mobile phone	Gill net	Gun	TV
Canoe	TV	Chainsaw	_____	_____	_____	_____

Productive assets (circle)

Ol samting bilong winim mane (makim wanwan ol igat na usum bilong winim mane)

Vehicle	Dinghy	Engine	Gill Net	Generator	Chainsaw	Wokabaut sawmill
Vegetable Garden	Cocoa plantation	Coconut plantation	Oil Palm plantation	Buai plantation	Tobacco garden	Canteen
Pigs for selling	Chickens for selling	House for rent	TV/DVD player	Satellite dish	_____	_____

Key Informants Survey Form

Site - Peles: _____

Name of Respondent –

Nem blo husait man/meri i bekim ol askim: _____

Date - Det: _____

Name of Interviewer –

Nem blo husait man/meri i wokim ol askim: _____

C1. Coastal and Marine Activities	C2. Goods & Services	C3. Harvesting methods and means of services	C6. Type of use by outsiders	C7. Monetary Value (high, medium, low)		
Wanem ol wok ol lain lo ples i save wokim lo bus na solwara	Wanem ol samting ol lain lo ples isave kisim long ol displa wok	Wanem samting ol lain save usim long wok lo bus na solwara.	Wanem kain wok ol lain arasait long ples isave kam wokim long peles	Moni mak blo ol samting ol lain kisim lo bus o solwara. Makim wanpla. (✓)		
				Bikpla moni	Planti moni tumas	Liklik moni tasol

C8. Market of Coastal and marine Goods and Services

C2. Coastal and Marine Goods & Services	C8. Markets		
	% International	% National	% Local
Wanem ol samting ol lain lo ples isave kisim long ol displa wok long bus na solwara	Arasait lo PNG	Insait lo PNG Arasait lo Niu Ailan	Insait lo Niu Ailan

C9. Gender Roles and Responsibilities in Coastal and Marine Activities

[illegible]

D2. Number and Profile of Visitors

[illegible]

ST1. Stakeholder groups

Identify the stakeholders involved in coastal management decision-making, planning, implementation, and monitoring.

Neimim ol lain o grup istap insait lo wok bilong lukautim ol marin risos long ples.

Stakeholder <i>Grup or lain insait lo wok bilong lukautim ol marin risos long ples bilong u</i>	Type of involvement <i>Long wanem kain rot?</i>

ST 2. Stakeholder's participation in management.

C1. Coastal and Marine Activities	Stakeholder group 1. Direct resource users	Stakeholder group 2. Those affected by coastal resource use & management	Stakeholder group 3. Those who do not use or impact the resources but have a stake in management
<i>Wanem ol wok ol lain lo ples i save wokim lo bus o solwara</i>	<i>Ol lain long peles we isave go kisim ol risos lo bus o solwara</i>	<i>Ol lain we ino save go olyet long kisim ol samting long bus o solwarablong displa peles tasol ol isave kisim sampla kain halivim long ol displa samting (ol baya)</i>	<i>Ol lain usait ino save usim ol risos we istap insait long bus o solwara blong displa tasol ol igat laik long wok blong lukautim ol displa samting</i>

M2. Management types and structures

12 (a). Describe the type of management at the site?

Wanem kain marin risos menismen istap long ples bilong u?

12 (b). Identify and describe the institutions and organizations that have decision-making and management authority for the site.

Nem bilong ol lain isave wok bung long lukautim tambu rip bilong u na wanem kain wok ol mekim.

Organization/Individuals	Type of involvement (decision making and management authority for the site)
<i>Ol man o organisation</i>	<i>Wanem kain wok or powa ol igat long lukaut long tambu aria bilong u.</i>

Appendix 3. Original survey forms

Household Survey Form - Ungakum

Location: Tsoi Island

Specific Location: Ungakum

Name of Interviewee:

Date:

Name of Interviewer:

Name of recorder:

No.	Name	D4.Age	D5. Martial status	D6.Sex (F/M)	D7. Education/ Literacy (yrs)	D8. Ethnicity (Waira or As ples-specify)	D9. Religion	D 11.Occupation	
								Primary	Secondary

D12. Sources of Household Income

Occupation	Percent noted as primary source	Percent noted as secondary source
Fishing		
Tourism		
Agriculture		
Remittance		

D13. Material Style of Life/Household Economic Status

Household material and appliances

Type of roof: Corrugated iron ____ wood____ thatch____

Type of outside structural walls: Tile__ concrete__ wood__ thatch/bamboo__

Windows: Glass__ wooden__ open__ none__

Floors: wooden__ cement__ thatch/bamboo__ dirt__

Toilets: pail flush__ outdoor__

Water: Tank__ well__

Electricity: From power plant____ from home generator__ no__

Household furnishing:

Home appliances:

Productive assets:

Key Informant Survey - Ungakum

Location: Tsoi Island

Specific Location: Ungakum

Date of interview:

Name of Interviewee:

Name of Interviewer:

Name of recorder:

Please introduce yourselves before the survey

D2. Number and profile of Visitors

Type of visitor	Number per year	Purpose

C1. Yu save usim solwara long wanem kain rot? Givim tupela tasol.

C2. Wanem ol samting (goods and services) yupela kisim long marine resources blong yupel.

C3. Wanem methods and means of services ikamap long ol marine resources blong yupela.

C1. Marine and coastal Activities	C2. Coastal and marine goods and services	C3. Harvesting methods and means of services
1. Fishing (Commercial fishing)	Reef fish	Trap Line
	Lalai	Diving
	Beche-der-mer	Diving
2. Local market sales	Fish. Crabs, cray fish, shells (clams, kina, long tail) Octopus	Hand collecting, line fishing Spear fishing/
3. Tourism	Supply of marine products	Spear fishing Hand collecting (mud crabs)

C5. Dependence on Coastal and Marine Goods and Services

C1. Marine and coastal Activities	C2. Coastal and marine goods and services	C5. Proportion of Dependency	
		% own consumption	% Sale (Income generation)
1. Fishing	Reef fish		
	Shell fish		
2. Tourism	Provision of sea food		
3. Sea transport	transportation		
4. swimming			
5. waste disposal			
6. collection of shells (gleaning)			
7. Mangrove	Building, firewood , collecting shells, crabs		

C6. Types and level of Use by Outsiders

C1. Marine and coastal Activities	C2. Coastal and marine goods and services	C6. Types of Use by Outsiders	C6. Level of use by Outsiders (low, medium, high)
1. Fishing (Pouching)	Catching fish	Trolling	
	Fishing dories		
2. Mangrove harvest	Building materials sales	Building materials	

C7. Monetary Value of goods and services

C1. Marine and coastal Activities	C2. Coastal and marine goods and services	C7. Monetary Value (low, medium, high)
1. Fishing	Reef fish	
	Beche-de-mer	
2. Tourism	Provision of food	

C8. Market of Coastal and Marine Goods and Services

	C8. Monetary Value		
C2. Coastal and marine goods and services	% international	% national	% local
Reef fish			
Octopus			
Hotel development			
Recreational fishing			
Diving			
Shellfish			
Lobster			
Coconut crabs			
Lalai			

C9. Gender Roles and Responsibilities in Coastal and Marine Activities

	C9. Gender Roles and responsibilities	
C1. Marine and coastal activities	Sex and age group (specify children, adult or older people)	Explanation (why are activities carried out by only males or females?)

<u>Extractive</u>			
Fisheries			
Hook and line			
Trap			
Collection at low tide			
<u>Non-extractive</u>			
Tourism			
Food exchange			
Fish trading			

ST2: Stakeholder Participation in Management

Coastal Activities	Stakeholder Participation (Yes/No)	In what way
Fishing		
Tourism		
Mangrove Harvesting		
Residential Development		



SEM-Pasifika Training and Assessment in Dabanot and Silom, New Ireland Province, PNG

Use of the SEM-Pasifika guidelines to train local community members to assess Socio-economic conditions and attitudes toward marine resource management within the Dabanot and Silom Communities

**The Wildlife Conservation Society's
PNG Marine Program
and
The PNG Center for Locally Managed Areas**

Prepared by:

Katherine Holmes
Modi Pontio
Jane Wia
and
Socio-Economic Monitors from
Ungakum, Kavulik, Dabanot, and Silom Villages

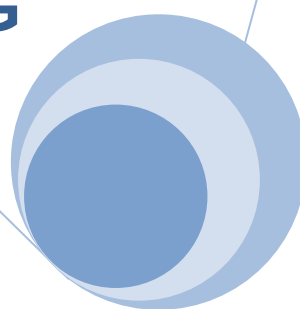
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1. Introduction

A Social Economic Monitoring – Pasifika (SEM-Pasifika or SEM-P) training was organized and conducted by the Wildlife Conservation Society's (WCS) Papua New Guinea Marine Program and the Papua New Guinea Centre for Locally Managed Areas (PNGCLMA) using the socio-economic monitoring or "SocMon" guidelines produced by the NOAA Socio-economic Monitoring program. These guidelines, a collaboration between the South Pacific Regional Environment Program (SPREP), the NOAA Socio-economic Monitoring Program, and other groups, were published to provide basic guidance to nearshore marine and coastal zone managers in socio-economic assessment and monitoring. This report documents the results of a series of training workshops in which participants received training in the SEM-Pasifika methods and, with the guidance of facilitators, conducted socio-economic monitoring planning, data collection, data analyses, and communication activities in New Ireland.

Since 2006, WCS has been partnering with four coastal communities in New Ireland Province, Papua New Guinea (PNG) to establish and manage customary *tambu* no-take closures, or marine reserves. Our ongoing work with these communities involves ecological monitoring within and outside of these reserves to assess the status of marine resources and effects of management measures; facilitating the production, adoption, and implementation of management plans for these locally managed marine areas (LMMAs); building staff capacity in marine conservation research and community-based conservation; training staff and villagers in ecological monitoring; and providing technical assistance and facilitation for community management decision-making processes.

This project, under NOAA's International Coral Reef Conservation Program, aimed to establish a socio-economic monitoring program based on the SEM-Pasifika protocol at these four sites. Socio-economic assessments generated data that can inform communities and marine management area committees, as well as WCS, on the effects of no-take closures in the villages over time and guide adaptive management of coastal marine resources. The project emphasized training villagers to undertake the surveys and basic analyses of the results. Provincial Government Fisheries officers were also trained in the monitoring process. Two of these sites are members of PNGCLMA, which has been tasked with trialing the SEM-Pasifika process as a model for PNG.

Unlike previous SEM-Pasifika trainings conducted by PNGCLMA, this training effort was split into three separate workshops. This was in part due to logistical considerations; the communities are geographically separated with one pair of communities two hours by boat west of Kavieng (the capital of New Ireland Province) and the other pair three hours east by road. Participants met together at a training center just outside of Kavieng for the first part of the training from May 18th to 21st, 2010. This workshop was attended by 12 community members and five provincial fisheries officers. During the workshop, the participants were taken through intensive sessions where they learned about the nature and value of socio-economic assessments and monitoring, identified the goals of their particular management areas and shaped socio-economic surveys unique to each of their communities. The second workshop took place from February 28th to March 5th, 2011 in Ungakum Village when participants were taught to administer the surveys and gathered data within Ungakum Village. This training was attended by nine community members, two fisheries officers and three WCS staff members. They were unable to repeat the data collection in nearby Kavulik Village because the distance between the two communities would not allow monitors to conduct the monitoring on a day's trip. The third workshop took place from March 28th to April 2nd, 2011 in Dabanot Village and was overseen just by WCS staff and participants redesigned their original surveys and were guided in administering and analyzing some of the findings within both Dabanot and Silom Villages. This training was attended by five new participants and four participants that had already attended the training in Ungakum but were included in this training to enhance their skills and

understanding. The challenge we faced with this arrangement was that we could not get all of the same people from the first workshop to attend the Ungakum and Dabanot trainings because some participants were no longer available for various reasons. However this was overcome by spending the first two days of training in both Ungakum and Dabanot on reviewing the theoretical concepts and survey design approach covered in the first workshop before proceeding to administering the surveys.

This report summaries the process and findings generated by surveys conducted within Silom and Dabanot Villages.

2. Background and Site Description

New Ireland is located in northern PNG in the Bismarck Archipelago. It consists of 9600 km² of small island groups and the main island of New Ireland. It includes the main islands of East, Tabar, Lihir, Anbir and Tanga island groups and the islands of Lavongai, Dyaul and Tingwon. Most of these islands have mountains in the center of over 500 m, which are surrounded by narrow limestone plains. The outer edges of the island of New Ireland are made up of narrow coastal limestone plains, floodplains and hills. The estimated population of New Ireland is 118,350 (2000 census) with slightly more males than females. Less than half of the total land area is occupied and with a population per square km² of occupied area of 28.4%.

The provincial headquarters, Kavieng, is situated at the northern tip of the island. It has a large, beautiful harbour and is a popular destination for game fishing and surfing enthusiasts. New Ireland is divided into two districts, nine Local Level Governments and 138 Wards. New Ireland has universal basic education, a literacy rate of 77.4% and the people have an average life expectancy at 57.9 years.

Most people on the main island and from Lavongai earn income from sales of copra, cocoa, oil palm and fish and garden produce. Lihir Island is reputed to have the second largest gold deposit in the world and, together with Simberi gold mine, they provide wages to employees and royalties to landowners. People from the Lelet Plateau on the main island receive good income from the sale of fresh garden food.

New Ireland has a road network that runs the length of the island both on the North and the South coast but is of varying quality. Water transport is most important between all the islands in the province.

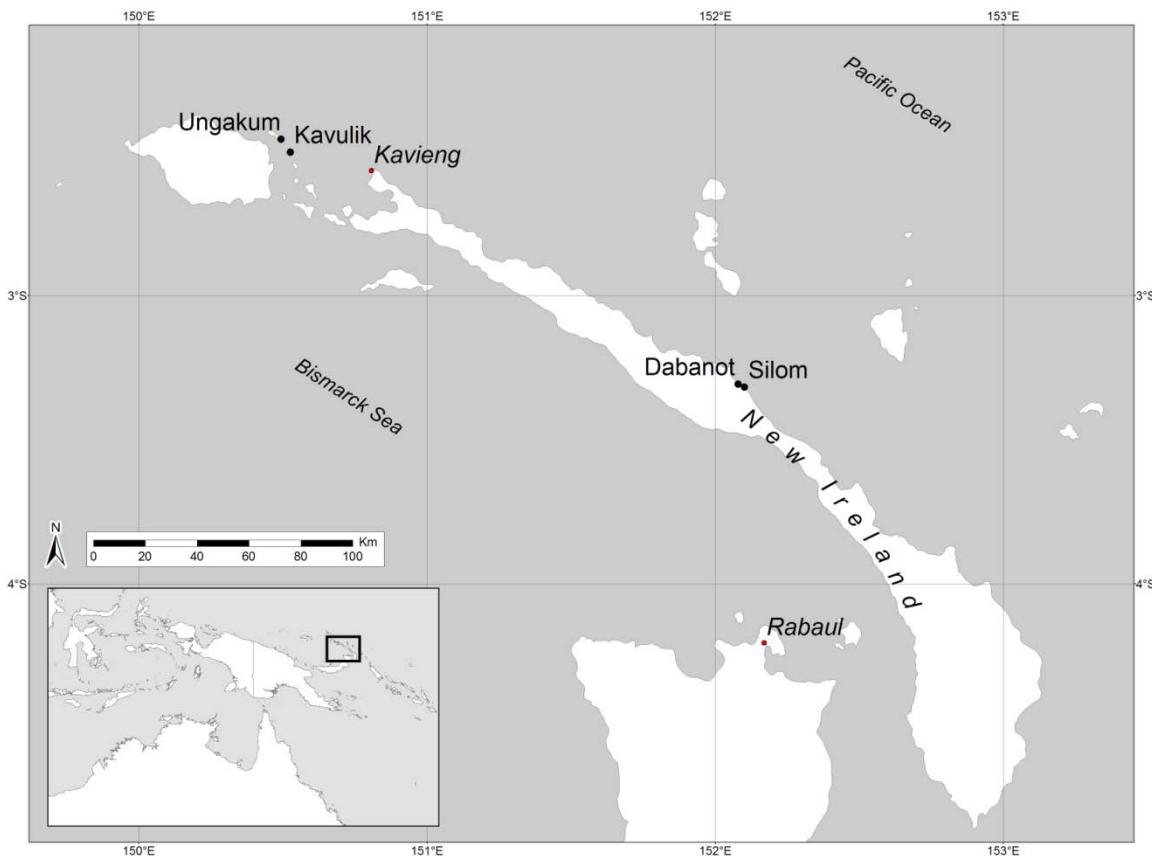
New Ireland prides itself with long stretches of beautiful white sandy beaches and many small, uninhabited islands. The marine ecosystem includes lagoon areas that are quite extensive in some areas, mangrove forests, patches of seagrass, and coral reef areas that lead to sharp drops at the reef edge in some areas while in others the drop is gradual.

Like most places in PNG, New Ireland has a high rural population that depends very heavily on their environment for their livelihood sustenance. As well as maintaining garden crops and livestock, most coastal communities depend very heavily on their marine resources to supplement what they can find from their gardens and bush for their own consumption and for income generation. As a result, their marine resources are at risk from overfishing, sedimentation from land based industrial and agricultural activities such as mining, logging and the effects of climate change. The increase in population also adds pressure on the natural resources. To address these threats some communities have placed management over their marine resources in the form of no-take closures or *tambu areas*. *Tambu areas* are a management tool where communities set aside portions of their marine

tenure to allow recovery of their marine resources. *Tambu* areas can be a semi-closure or complete closure for as long as the community wants.

The Wildlife Conservation Society has worked with the communities of Ungakum, Kavulik in the Tsoi Islands in Lavongai, Kavieng District and with Silom and Dabanot villages along the main island in Namatanai District since 2006 to support the communities' *tambu* area management efforts (see map).

Map 1. New Ireland Province and the location of the four village sites targeted in this project – Ungakum, Kavulik, Dabanot and Silom – as well as the provincial capital, Kavieng, which is the site of the WCS PNG Marine Program office.



Dabanot is located approximately 172 km to the south of Kavieng in the Namatanai District. It has a population of 216 (2000 census) with houses clustered in groups along 1 km of shoreline. The *tambu* area here starts to the north of the main village, and continues north for approximately 1.1 km. The area comprises of three main habitats: the lagoon, reef crest and fore reef and reef slope. The lagoon consists mainly of boulders and sargassum and average depth between 0.5 to 2.0 m deep and back reef area extends from the shore to reef crest – a distance varying between 50 and 100 m. The reef crest is dominated by areas of rock substrate with occasional coral gardens down to a depth of 3 m. The reef slope gradually slopes from 3-4 m deep to reach a sandy bottom at between 12 to 20 m. The reef slope is fairly populated with corals and sponges. Dabanot originally served as a control site for ecological surveys to compare with Silom's *tambu* area but, after learning from Silom, they too decide they wanted a *tambu* area to increase fish populations and improve the health of their reef system.

Silom is located nearby to Dabanot, approximately 188 kilometers southeast of Kavieng, in Namatanai District. The community is actually called "Silom 1"; another community called "Silom 2" is adjacent to "Silom 1". For simplicity's sake, we use the title Silom throughout this report to refer to Silom 1. The community is organized into hamlets irregularly spaced along approximately 2 km of

shoreline, with some houses located along the highway. Silom (including both Silom 1 and Silom 2) has a population of 220 (2000 census). Although people here are more heavily dependent on garden food and cash crops such as copra, cocoa and oil palm for cash income, they also depend on their marine resources to supplement their diet and for income generation. The *tambu* area here is located directly adjacent to the village, starting at the high tide mark, encompassing the lagoon and extending to the edge of the reef approximately 200m from the reef crest and runs for a length of 0.96 km. The habitat here consists of the lagoon, the reef crest and fore reef, and the reef slope. The main reason for establishing the *tambu* site is to increase fish populations and improve the health of the corals and reef system.

3. Methodology

The first training workshop was conducted in Kaselok Village outside of Kavieng at the Ranguva Solwara Skul. The participants from four communities (Ungakum, Kavulik, Silom and Dabanot) used the guidance of the SEM-Pasifika manual (available through the SocMon website at www.socmon.org) to identify and articulate: 1) any relevant management objectives for the local marine area, 2) assessment objectives and 3) the survey site area and indicators that would be used during the assessment training and data collection exercise. Participants from each community, alongside Provincial Fisheries Officers and under the guidance of the workshop leaders, designed data collection forms for key informant and household surveys (see Appendices). During the second training workshop in Ungakum, a subset of the original participants along with some newly identified participants collected data within the Ungakum community setting. Data forms were returned to the trainers and entered for analyses. The information was summarized and analyzed by workshop trainers and participants. During the data entry phase, a number of issues with the survey design and questions became apparent. This field component was repeated and improved upon during the workshop conducted in Dabanot. Based on their experiences during the Ungakum workshop, participants from Dabanot and Silom were able to critically assess the questions as posed within their original survey design and decided to improve their survey questions to better match their interests and clarify the questions. They also went through the exercise of translating the questions into *Tok Pisin* to help with elaborating on the questions during data gathering. In addition to redesigning the survey questions and conducting the survey, trainers of the third workshop focused more on teaching data analyses and presentation of the results to the communities than the previous workshop. Through this process, participants and WCS staff were able to learn from and improve upon the training with each visit to a new community. An additional round of improvements to the surveys have been made and the trainers and some of the participants have decided that it would be valuable to develop a single Household Survey Form and single Key Informant Survey form to be used in all four target communities in subsequent survey efforts. We hope for these to be used by the trained monitors from Kavulik and Ungakum to survey Kavulik community members in the months to come.

This report summarizes the process and findings generated by the newly trained socio-economic monitors' work in Dabanot and Silom Villages. Another report summarizes the same for Ungakum Village.

Assessment Goal

The goal of the socio-economic assessment and overall monitoring activities is to train local community members in some of the assessment approaches they can use to study their own communities and community needs. A subset of these community members will become "Community Socio-Economic Monitors". Ultimately, the surveys aim to provide the resident community, decision makers, and interested stakeholders with information useful for better understanding local conditions and the impact of resource management activities on the lives of community members. It is hoped

that greater community and stakeholder understanding of local conditions and impact of management activities will lead to greater support for present and future locally managed marine areas as an approach to safeguarding marine resources for the benefit of present and future generations. The use of local community socio-economic monitors will enable the community to take ownership and responsibility for the sustainable use and management of their natural resources.

Site Management Goal and Objectives

The primary coastal concern of local residents and managers is the maintenance of marine resources within nearby fishing grounds. The management goal of both the Dabanot and Silom Marine Management Areas as formulated by the workshop participants was stated as: “*Namba bilong pis long ol tambu eria long Silom na Dabanot bai mas kambek gen oslem long taim bipo long halivim mipela.*” (Fish abundance in the *tambu* areas of Silom and Dabanot must increase to how it was in the past in order to support our livelihoods.) The specific objectives were stated as: 1. “*By 2016 namba bilong pis bai mas go antap olsem klostu 30%.*” (By 2016, fish abundance will have increased by around 30%.) 2. “*By 2011, bai mas gat faivpela awareness program i kamap pinis long ples long toksave o skulim gut ol manmeri long lukautim solwara.*” (By 2011 there would have been five awareness sessions conducted in the community to raise awareness on how best to manage their resources.)

Assessment Objectives

Unfortunately the first workshop failed in helping participants from Dabanot and Silom clearly differentiate between their management objectives and assessment objectives. Participants were able to clearly articulate management objectives as well as figure out what information is needed to better assess those objectives and from there selected their survey indicators. However specific objectives relating to this particular assessment were not well formulated during the workshop. This is a failure of the trainers and not the community participants. From their stated management objectives around food security and awareness programs, three possible assessment objectives can be formulated, post hoc.

Objective 1: Train local community members in the value and approaches used for socio-economic surveying. Empower local communities to utilize socio-economic tools.

Objective 2: Assess the level of dependence of Dabanot and Silom community members on marine resources as they relate to food security.

Objective 3: Assess the level of understanding of community members of marine resources to help guide the design of awareness materials.

Assessment Indicators

Given the site management goals, and assessment objectives, the following assessment indicators from the SEM-Pasifika Guide (with manual identifier codes in brackets) were selected by the Silom and Dabanot workshop participants, with advice and guidance from the PNGCLMA workshop facilitators. Asterisks mark indicators that were not specifically identified by participants during the first workshop, but were agreed to and added by participants after their in-field experience during the workshop in Ungakum. Note that indicators C1 and C2 were included by the participants in both the Household and Key Informant Surveys. This allowed for a greater sample size for these questions than would have been gathered if only key informants were asked each question as well as a comparison of the information collected from the two different sources.

Table 1. Household indicators incorporated into Household Surveys conducted in Dabanot and Silom villages

1.	Age [D4]
2.	Sex [D6]
3.	Education And Literacy [D7]
4.	Ethnicity/Clan [D8] *
5.	Religion [D9]
6.	Occupation [D11]
7.	Sources Of Household Income [D12]
8.	Material Style Of Life/Household Economic Status [D13]
9.	Coastal And Marine Activities [C1]
10.	Coastal And Marine Goods And Services [C2]
11.	Dependence on coastal and marine resources [C5]
12.	Knowledge of Coastal and Marine Resources [C10]
13.	Attitudes Toward Coastal and Marine Resources [C11]
14.	Non-market and Non-Use Value [C12]
15.	Alternative and Supplementary Livelihoods [C13]
16.	Perceived Resource Condition [T2]
17.	Perceived Threats to Coastal and Marine Resources [T3]
18.	Awareness of Rules and Regulations [M11]

Table 2. Key Informant indicators incorporated into Key Informant Surveys conducted in Dabanot and Silom villages

1.	Coastal And Marine Activities [C1]
2.	Coastal Marine Goods and Services [C2]
3.	Means of Production of Goods and Services [C3]
4.	Types of Use by Outsiders [C6]
5.	Monetary Value of Goods and Services [C7]
6.	Market of Coastal and Marine Goods and Services [C8]
7.	Gender Roles And Responsibilities In Coastal And Marine Activities [C9]
8.	Number and Profile of Visitors [D2] *
9.	Stakeholder Groups [ST1]
10.	Stakeholder Participation [ST2] *
11.	Management Types and Structures [M2]

Data collecting methods

Following the development of the assessment plan, indicators list, and survey instruments. Although we discussed sampling design to calculate an ideal sample size, we decided we would interview all the households in Dabanot and Silom because of the small number of households. The surveys were conducted over a few days to suit the daily routine of the members of those households selected. Where possible, prior notice was given to members of the households. The participants were divided into three groups of three people each with a facilitator/trainer.

Twenty households were surveyed in Dabanot and five households were surveyed in Silom. Only two key informant interviews, both from Silom Village, were completed during the project. Due to the small sample size, participants tried to interview all the households rather than a subset of randomly chosen households. Those that were not interviewed were either not present or chose not to be interviewed.

4. Results

Findings for the selected indicators from household survey and key informant interviews are provided by topic below.

Household Survey Results

1) Population Size, Number of Households, and Household Size [D1]

Within Dabanot Village, 20 of a total of about 32 households were surveyed. Within this sample, the assessment counted a total of 106 people yielding an average of roughly five people per household in

the area. From this, we can estimate a total population of 170 people. The 2000 census counted a population of 220 people in Dabanot. Within Silom Village, five households were surveyed encompassing 32 people. This reveals an average of roughly six people per household in the area. Extrapolating, this would suggest that Silom currently has a population of around 70 people. The 2000 census counted a population of 220 people in Silom but this included community members from both Silom 1 and Silom 2.

2) Age [D4]

In Dabanot, the twenty households that were surveyed accounted for 106 people. Analysis indicates that majority of respondents (19.8%) are young infants in the 0-5 age group (Table 3). The next most common age bracket is 6-10 years old. The average age is 23 years.

Table 3. Distribution of age categories within the Dabanot community

Age Groups	Count	%
0-5	21	19.8
6-10	16	15.1
11-15	7	6.6
16-20	6	5.7
21-25	6	5.7
26-30	8	7.5
31-35	4	3.8
36-40	2	1.9
41-45	2	1.9
46-50	5	4.7
51-55	2	1.9
56-60	3	2.8
over 60	7	6.6
Don't know	17	16.0
Total	106	100

In Silom, the five households that were surveyed accounted for 32 people. Analysis indicates that a quarter of the samples are young infants of 5 years old or below. The next most common age bracket is 6-10 (Table 4). The average age is 20 years.

Table 4. Distribution of age categories within the Silom community

Age Groups	Count	%
0-5	8	25.0
6-10	6	18.8
11-15	1	3.1
16-20	0	0
21-25	0	0
26-30	0	0
31-35	2	6.3
36-40	3	9.4
41-45	0	0
46-50	1	3.1
51-55	0	0
56-60	0	0
over 60	2	6.3
Don't know	9	28.1
Total	32	100

3) Gender (Sex) [D6]

The Dabanot sample was biased toward males with 56% males and 44% females while the Silom sample was similarly biased toward females with 56% female and 44% males included within the household surveys.

Table 5. Gender breakdown, Dabanot

Gender	%
Male	56
Female	44
Total	100

Table 6. Gender breakdown, Silom

Gender	%
Male	44
Female	56
Total	100

4) Education and Literacy [D7]

Of the 106 people surveyed through the Household Surveys in Dabanot, 61 were over the age of 16 and included in the Education analyses. In Dabanot, 56% of adults have had 6 to 10 years of formal education (Table 7).

Table 7. Formal education breakdown, Dabanot

Years of Education	Count	%
No Formal Education	6	9.8
1-5 Years	17	27.9
6-10 Years	34	55.7
11+ Years	4	6.6
Total	61	100

Of the 32 people surveyed through the Household Surveys in Silom, 13 were over the age of 16 and included in the Education analyses. The greatest proportion of adults (62%) in Silom have had 6 to 10 years of formal education (Table 8).

Table 8. Formal education breakdown, Silom

Years of Education	Count	%
No Formal Education	2	15.4
1-5 Years	2	15.4
6-10 Years	8	61.5
11+ Years	1	7.7
Total	13	100

5) Ethnicity / Clan [D8]

Broadly, ethnicity within both Dabanot and Silom is uniformly comprised 100% of Melanesian Pacific Islanders indigenous to Papua New Guinea. To further classify individuals, the assessment team collected information on whether people are from the Village or *waira* (an outsider). Additional breakdowns of place of origin were not collected for either community. In hindsight, it would have been valuable to collect information on clan membership for each surveyed person. We have made this addition to the revised survey.

Table 9. Place of origin, Dabanot

Place of Origin	Count	%
Dabanot	62	58.5
Outside Dabanot	44	41.5
Total	106	100

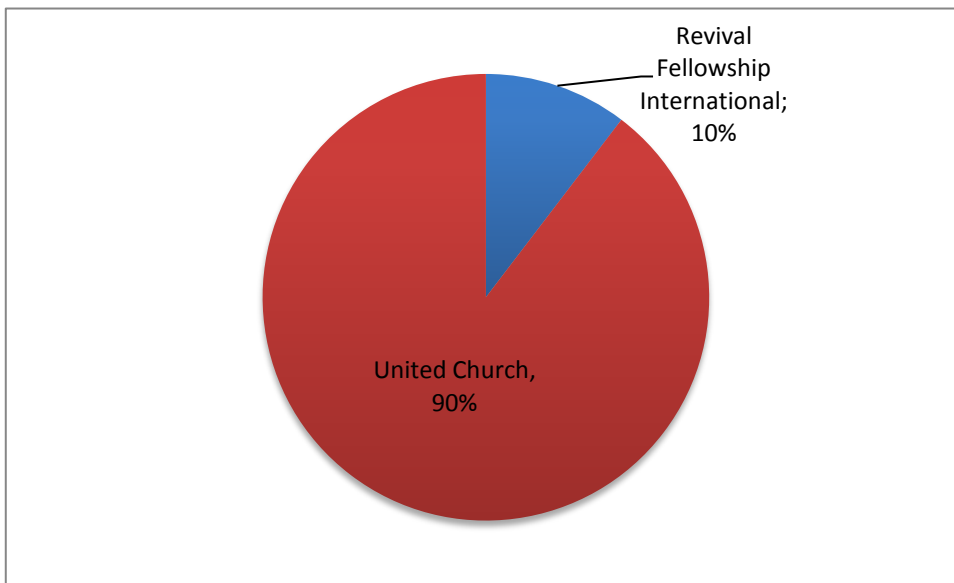
Table 10. Place of origin, Silom

Place of Origin	Count	%
Silom	28	87.5
Outside Silom	4	12.5
Total	32	100

6) Religion [D9]

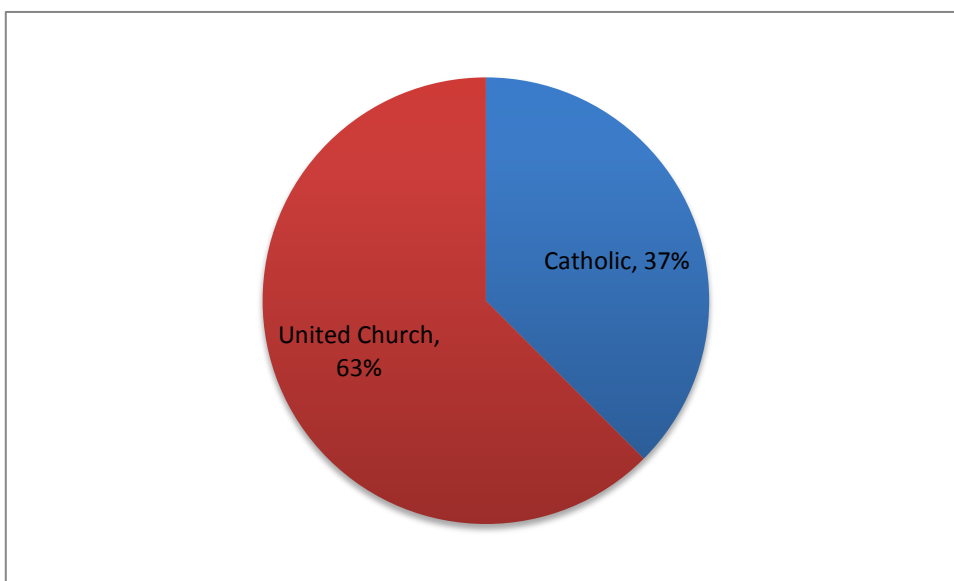
In Dabanot, the majority of the respondents belonged to the United Church (81%), followed by Revival Fellowship International (9%) (Figure 1).

Figure 1. Christian denominations within Dabanot



In Silom, the United Church (63%) is also the dominant religion however the other observed religion is the Catholic Church (37%) (Figure 2).

Figure 2. Christian within Silom

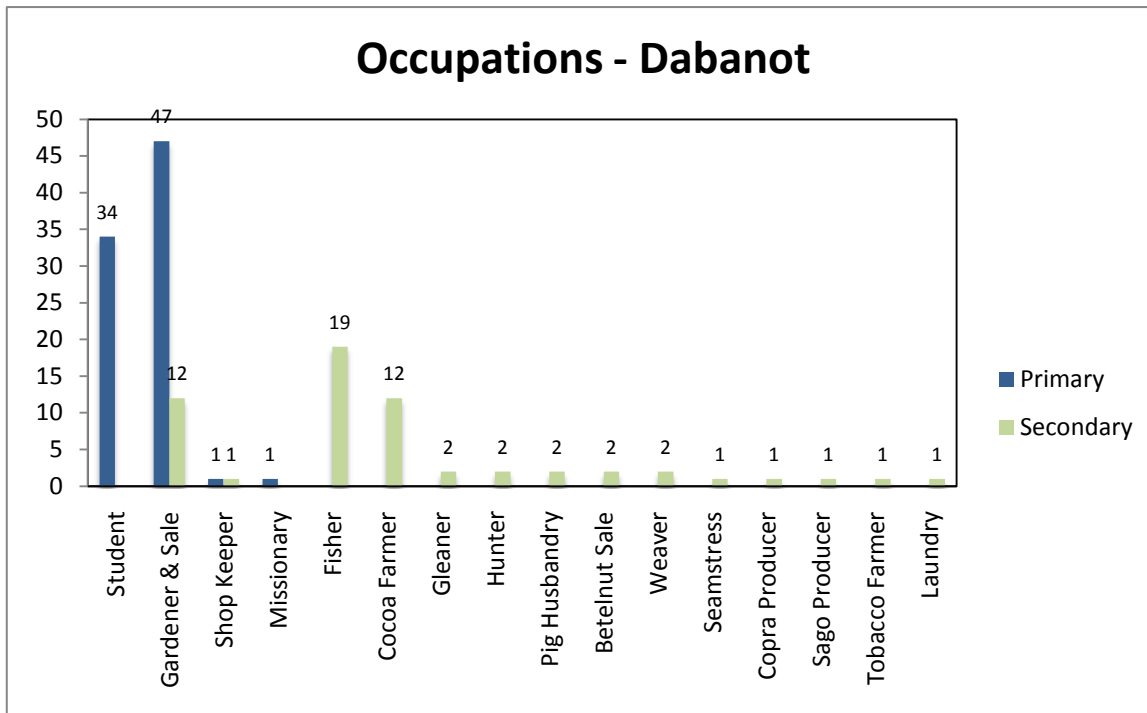


7) Occupation [D11]

Children not of school age were not included in the Occupation analyses. Respondents were asked their primary occupation and, if applicable, secondary occupations. In cases where respondents listed two secondary occupations, these were not ranked into secondary and tertiary but all included as secondary occupations.

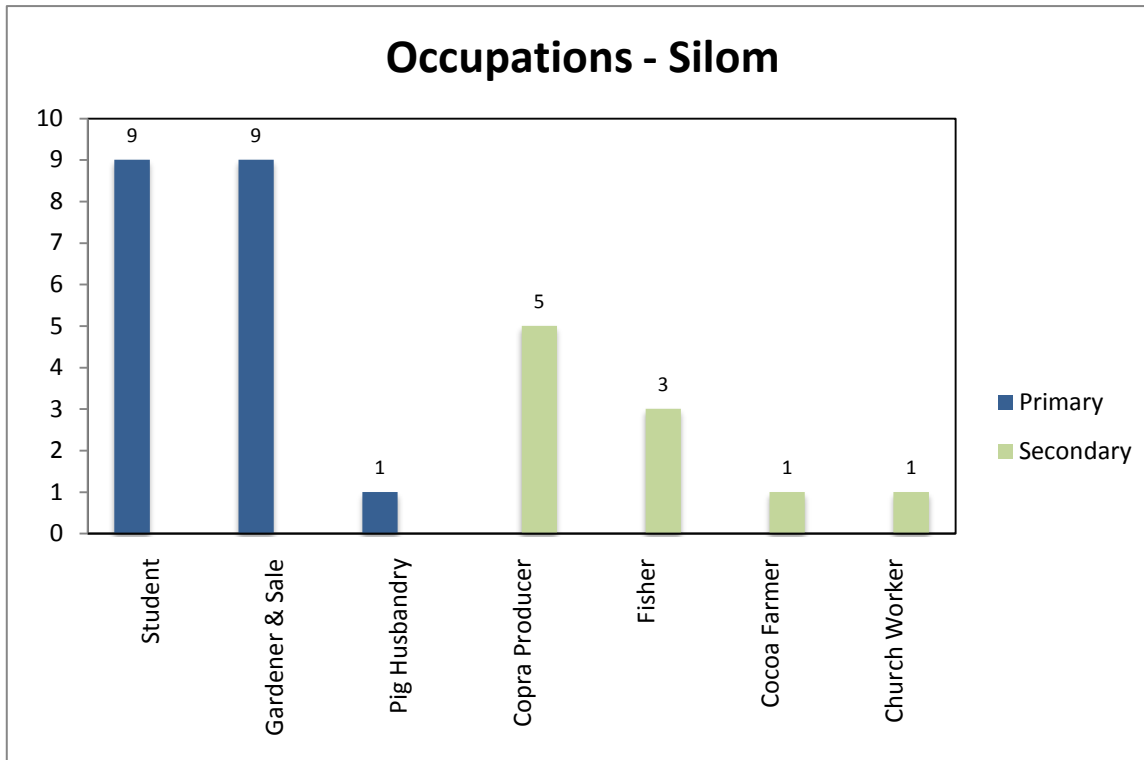
Dabanot community members identify themselves primarily as gardeners (57% of primary occupations) and students (41%). Fishing and cocoa farming are common only as secondary occupations (Figure 3).

Figure 3. Primary and secondary occupations in Dabanot Village



Silom community members similarly identify themselves primarily as gardeners and students (both 47%). Copra farming and fishing (50 and 30% of secondary occupations, respectively) are common only as secondary occupations.

Figure 4. Primary and secondary occupations in Silom Village



8) Sources of Household Income [D12]

In line with data collected on occupation, Dabanot and Silom community members' main source of income is from gardening (70.0% and 37.5% as a primary source of income for Dabanot and Silom, respectively) (Figures 5 and 6). Fishing is the second greatest primary income earner in Dabanot (10.3% and 25%, respectively) (Figure 5). Copra is a more important income earner in Silom than fishing (25% of primary and 37.5% of secondary) (Figure 6). Cocoa is an important source of secondary income in both communities and betelnut sales was identified as an important secondary income source in Dabanot.

In the revised survey, we have expanded on this question; it now asks for all activities people are involved in to bring in food and money and asks them to also rank them in order of importance. This incorporates what was covered by the original D11 question, above but restricts the options. A new second component to the question asks about household expenses asking for an average of what each household may have spent over the last fortnight. We realize the sensitivity of this question but have left it there to be asked where the situation allows.

Figure 5. Primary and secondary sources of income in Dabanot Village

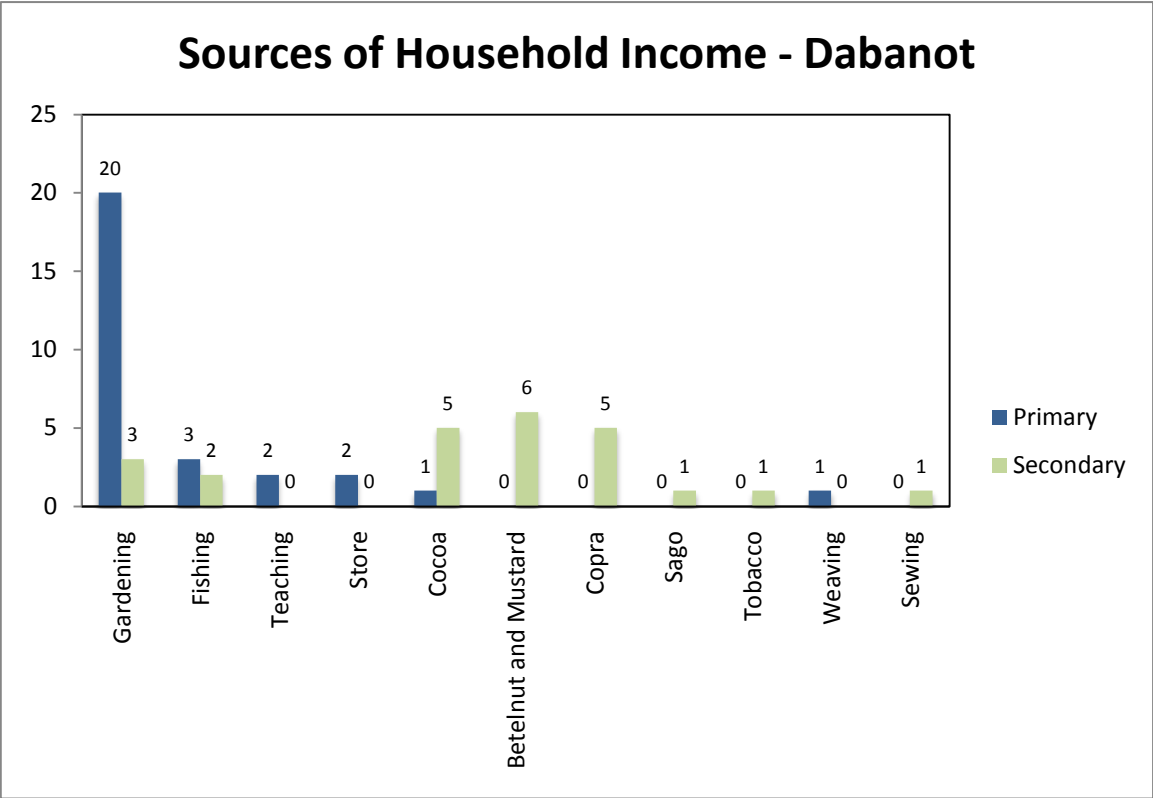
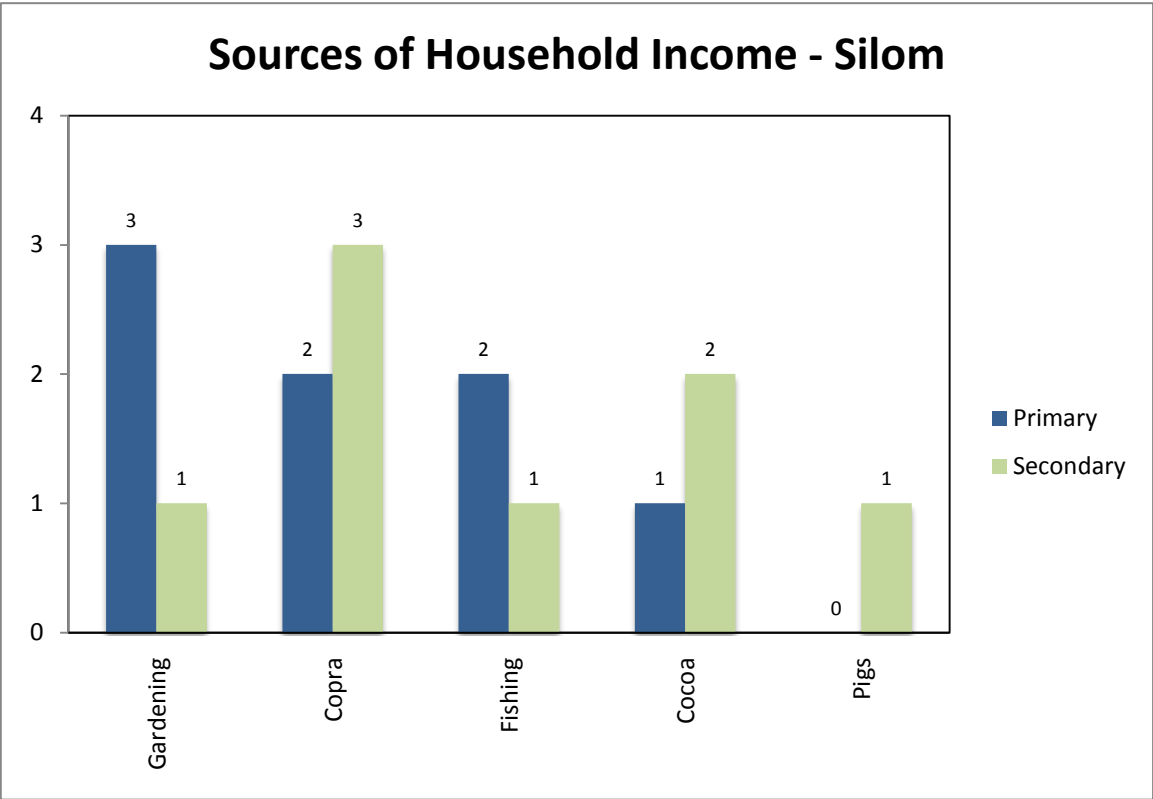


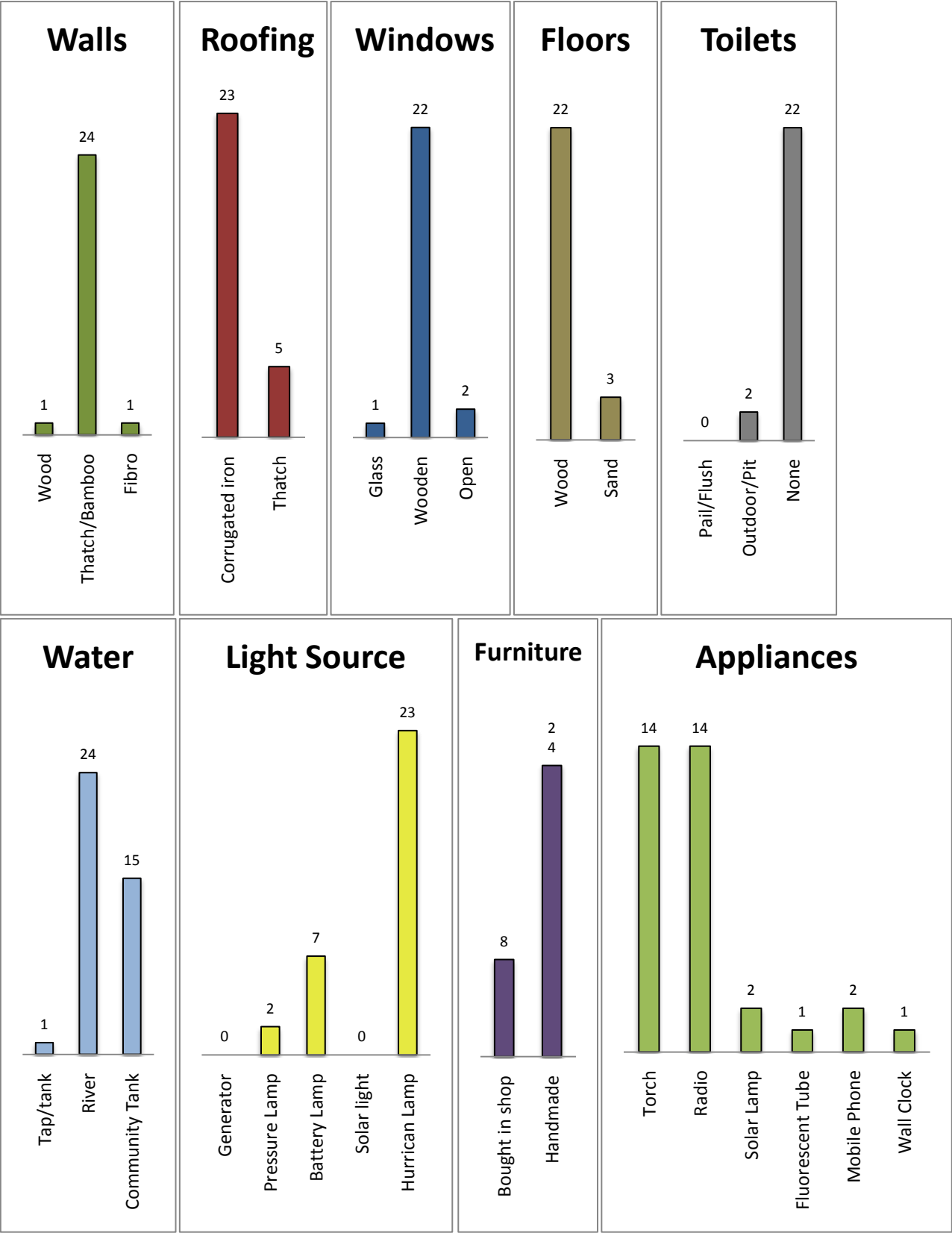
Figure 6. Primary and secondary sources of income in Silom Village

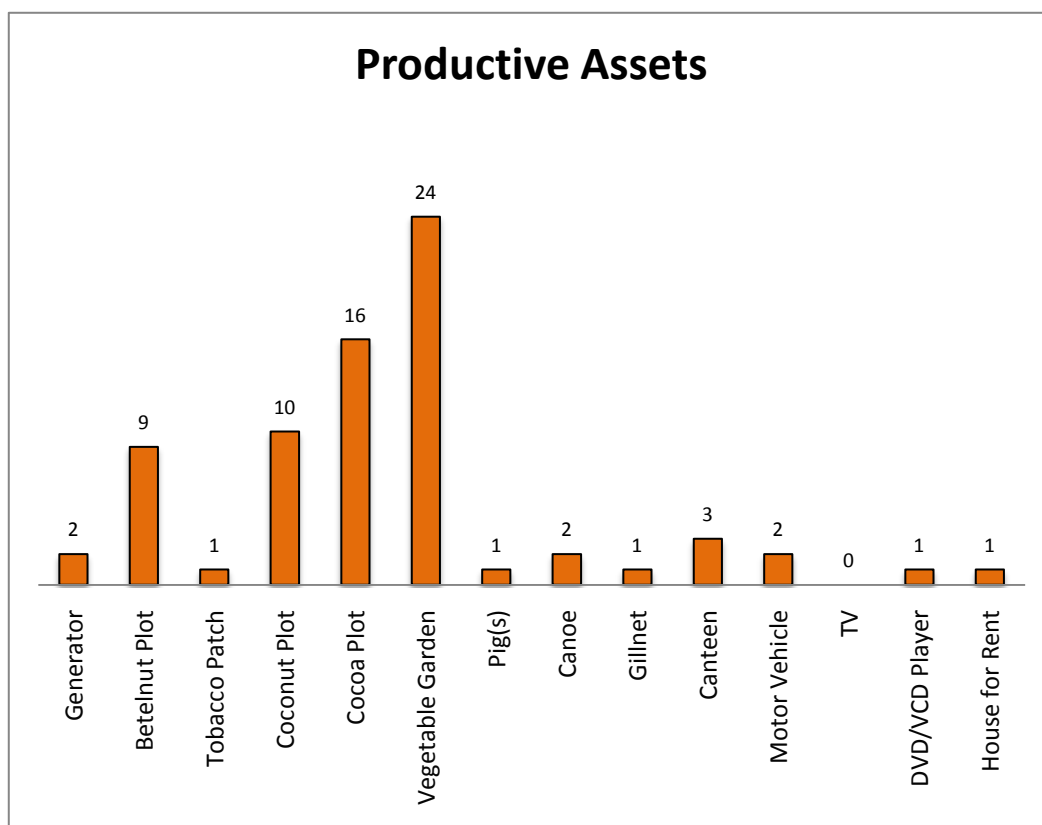


9) *Material Style of Life/Household Economic Status [D13]*

For the indicator Material Style of Life and Household Economic Status, a monitor made observations of each home's characteristics. These observations, combining data for Dabanot and Silom, are summarized in Figure 5. A majority of the houses across the two communities are semi-permanent with wooden floors, thatch/bamboo walls, and corrugated iron roofs and use hurricane lamps for lighting. Most houses do not have sanitation facilities and water is generally collected from a river and shared community water tanks. Most of the community members do not own expensive items. The most commonly owned appliances are torches and radios. The monitors identified vegetable gardens as the most common productive asset. Marine-related items, such as canoes and gill nets, are not common assets in these communities.

Figure 7. Household material goods and productive assets, Dabanot and Silom villages





10) Coastal and Marine Activities [C1], Goods and Services [C2], and Proportion of Dependency [C5]

Table 11 lists the marine and coastal activities that Dabanot households identified and the number of households that mentioned each activity. Each respondent was asked to estimate the percentage that the goods or services from the activity are for their own consumption versus generating income.

Dabanot community members mentioned four activities (Table 10) and corresponding goods and services. One of the activities, diving for trochus, could not be easily split into percent for consumption versus percent for income since, generally, community members will collect trochus for both personal consumption of the meat and sale of the shell, the average and range expressed likely reflects that, although the trochus will be used both for consumption and for income generation, the *incentive* for collecting trochus is for income generation.

Table 11. Coastal and marine activities of Dabanot community members

Coastal/Marine Activity	Goods and Services	Count	% Own consumption Average (Range)	% Income generating Average (Range)
Fishing, including hook and line, net, and spear	Fish and income	20	60 (10 – 100)	40 (0 – 90)
Diving for lobster	Lobster meat	3	46 (0 – 100)	54 (0 – 100)
Diving for trochus	Meat for food; Shells for sale	3	64 (0 – 100)	79 (25 – 100)
Bathing	Sanitation	5	100	0

The five community households interviewed in Silom all mentioned fishing as a marine activity with an average of 92.5% for own consumption versus 7.5% for income generation. No other marine activities were identified.

11) Knowledge of Coastal and Marine Resources [C10]

Within the SEM-Pasifika guide, environmental knowledge refers to local understanding of the facts and issues related to local marine and coastal environment. It is a knowledge that comes from stakeholder experience, observation, beliefs, and perception of cause and effect. Higher levels of environmental knowledge can lead to collaboration of stakeholders that, in turn, allow for management success as people are more likely to understand how the natural ecosystem works and how to protect and manage the environment. On the contrary, low level of environmental knowledge may lead managers to develop educational materials and outreach activities to create environmental awareness or correct misconceptions.

Table 12 presents information on a series of questions intended to indicate the general level of knowledge of coastal marine resources. The correct answers to statements a, b, and d should be 'true', while answers to the remaining statements – c, e, and f – are 'false'. In Dabanot, only one person answered d wrong and likewise with question f. The question which generated the greatest incorrect answers was c about breaking corals. This has identified one particular area that educational initiatives could address and suggests that there are likely many other areas where more outreach could help with the community's objectives regarding increased understanding of marine resources. Only five households in Silom were interviewed so it's more difficult to draw conclusions on their knowledge of coastal marine resources. Since the sample size is so low, presenting percentages would be misleading and only counts are presented here (Table 13). Those interviewees had problems with questions c, e, and f all of which deal with corals. This also suggests that in Silom awareness around corals and their nature could greatly benefit local understanding of corals and how and why they should be protected from unnecessary harm. It is interesting to note that these communities listed additional awareness sessions under their Site Management Objectives (see above). This reflects an accurate self-assessment by the monitors prior to the surveying that they are lacking important knowledge and understanding of marine resources that could be addressed through awareness.

Table 12. Knowledge of coastal and marine resources in Dabanot

Statements	% true	% false
a. Coral is a living animal.	100	0
b. Seagrass beds provide habitat for baby fish.	100	0
c. Breaking corals to catch octopus is not destructive to the reef.	30	70
d. The tambu area will contribute to increase in the supply of fish in the whole area.	95	5
e. Coral bleaching is a sign of healthy reefs.	0	100
f. Breaking of live corals for lime production is a sustainable income-generating activity.	5	95

Table 13. Knowledge of coastal and marine resources in Silom

Statements	# true	# false
a. Coral is a living animal.	5	0
b. Seagrass beds provide habitat for baby fish.	5	0
c. Breaking corals to catch octopus is not destructive to the reef.	3	2
d. The tambu area will contribute to increase in the supply of fish in the whole area.	5	0
e. Coral bleaching is a sign of healthy reefs.	2	3
f. Breaking of live corals for lime production is a sustainable income-generating activity.	3	2

12) Attitudes Toward Coastal and Marine Resources [C11]

Respondents were also asked to either agree or disagree to the statements in Table 14. In Dabanot, where 20 households were surveyed, responses for each of five categories (Strongly disagree, agree, Neither, Agree, and Strongly agree) are presented as percentages (Table 14). For Silom, only four surveyed responded so those data are presented simply as counts (Table 15).

Statements b, c, and d are statements if agreed to show positive attitudes towards coastal and marine resources. Statements a and e are statements that show negative attitudes if agreed to.

In Dabanot, the majority of responses tended toward positive attitudes to coastal and marine resources though there was not one statement where all the responses were completely positive. In Silom, trends were similar except for question a, regarding *tambu* areas.

It is difficult to interpret the responses regarding this question. We recognize that community attitudes toward a *tambu* area in both Silom and Dabanot are, indeed, mixed so some negative responses were to be expected. However, at least one respondent who is known to be very strong supporter of his local *tambu* area responded that he “strongly agreed” that he would “not vote for a *tambu* area”. This suggests that he misunderstood the question as it was asked or that it was asked incorrectly or lost its meaning in translation from English to *Tok Pisin* to the local *Tok Ples*. Perhaps the SEM-Pasifika question is poor since it requires a confusing double-negative in order to express support; people would not use a sentence such as “I strongly disagree that I would not vote for a *tambu* area.” Furthermore, the mixed responses to this question are in opposition to the completely positive attitudes toward setting aside a marine area as expressed by all respondents (from both Dabanot and Silom) regarding the non-marine and non-use values (see Non-Marine and Non-Use Values indicator C12, question g, below). But, also, considering that the *tambu* areas are responsible for eliminating fishing as a livelihood for three respondents (see Livelihoods, indicator C13, below), it is not surprising that there are mixed feelings regarding the areas.

The local attitudes toward the *tambu* areas are important and will need to be further assessed through discussions with community members. And the question itself has been reconstructed for future surveys so that it will be easier to understand, ask, and interpret.

Table 14. Attitudes toward coastal and marine resources in Dabanot, expressed in percentages

Statements	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. I would not vote for a <i>tambu</i> area near my village.	60	5	5	15	15
b. It is important that all community members look after the reef.	0	0	5	15	80
c. My family's health and well-being are linked to the health of our marine habitats.	5	10	15	15	60
d. It is an important part of our culture to have a healthy marine environment.	5	0	0	15	80
e. It doesn't matter what happens to our marine environment.	75	5	10	0	10

Table 15. Attitudes toward coastal and marine resources in Silom, expressed in counts

Statements	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. I would not vote for a <i>tambu</i> area near my village.	0	0	0	2	2
b. It is important that all community members look after the reef.	0	0	0	1	3
c. My family's health and well-being are linked to the health of our marine habitats.	0	0	0	1	3
d. It is an important part of our culture to have a healthy marine environment.	0	0	0	1	3
e. It doesn't matter what happens to our marine environment.	0	2	0	1	1

13) Non-Marine and Non-Use Values [C12]

Respondents were also asked to either agree or disagree to the statements in Table 16. As above, in Dabanot, where 20 households were surveyed, responses for each of five categories (Strongly disagree, agree, Neither, Agree, and Strongly agree) are presented as percentages (Table 16). For Silom, only four surveyed responded to this question so those data are presented simply as counts (Table 17).

In both Silom and Dabanot, people see reefs as important for storm protection, that reefs tend to be more important to those who fish or dive, the sea is valued for removing waste from their beaches, protecting reefs will lead to greater fish abundance, and setting aside a marine area is important for future generations. There is no consistent attitude regarding the value of seagrass beds. The two communities differed in their attitudes regarding where *tambu* areas should be established; the few Silom respondents felt that *tambu* areas should be restricted to areas where people don't fish while Dabanot respondents felt otherwise.

These attitudes suggest awareness needs to be raised regarding the importance of proper waste disposal and the value of seagrass beds.

In the revised versions of the survey, the response categories have been reordered to go from "Strongly agree" to "Strongly disagree" for questions C11 and C12.

Table 16. Attitudes toward non-market and non-use values, Dabanot, expressed in percentages

Statements	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. The reefs are important for protecting land from storm waves.	0	0	10	5	85
b. Tambu areas should be restricted to those areas where no one goes fishing.	75	10	5	5	5
c. Coral reefs are only important if you fish or dive.	0	5	25	50	20
d. An important role the sea plays is to remove waste from our beaches.	0	5	15	45	35
e. Seagrass beds have no value to people.	10	10	30	40	10
f. When coral reefs are protected, we will have many fish to catch.	0	0	0	0	100
g. We should set aside an area of our coastal and marine area so that future generations can have a natural environment and be able to see what we see now.	0	0	0	0	100

Table 17. Attitudes toward non-market and non-use values, Silom, expressed in counts

Statements	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
a. The reefs are important for protecting land from storm waves.	0	0	0	0	4
b. Tambu areas should be restricted to those areas where no one goes fishing.	0	1	0	2	1
c. Coral reefs are only important if you fish or dive.	0	1	0	1	2
d. An important role the sea plays is to remove waste from our beaches.	0	0	0	0	4
e. Seagrass beds have no value to people.	0	0	1	1	2
f. When coral reefs are protected, we will have many fish to catch.	0	0	0	1	3
g. We should set aside an area of our coastal and marine area so that future generations can have a natural environment and be able to see what we see now.	0	0	0	0	4

14) Alternative and Supplementary Livelihoods [C13]

Respondents from Dabanot identified a variety of alternative and supplementary livelihoods they participated in three to five years ago and the reasons they've ceased them (Table 18). This question was not administered the same way in Silom where respondents all identified livelihoods that they also are currently involved in, as revealed by their responses regarding occupations and income (see D11 and D12) so they are not considered here. The most common past livelihood was running a canteen or shop which, in all cases, was forced to end due to credit buildup. Three respondents identified fish sales that no longer happened due to the creation of the *tambu* area. This could explain why other questions in the survey have identified negative feelings toward the *tambu* area.

Table 18. Alternative and supplementary livelihoods 3-5 years ago, Dabanot

Livelihood	Reason for Cessation	Count
Canteen	Credit buildup	4
Fish sale	<i>Tambu</i> area	3
Store manager	Family reasons	1
Road work	End of contract	1
Carpenter	Decision to stop	1
Pig sale	Sow no longer producing	1
Tobacco	Stopped planting	1
Sewing	Eye problems	1

15) Perceived Resource Conditions [T2]

Respondents were also asked to rank the condition of four of their resources. As above, in Dabanot, where 20 households were surveyed, responses for each of five categories (Very good, Good, Neither, Bad, or Very bad) are presented as percentages (Table 19). For Silom, only four surveyed responded so those data are presented simply as counts (Table 20).

Coral reefs, fresh water, and upland forest are all considered to be in neutral to very good condition. Seagrass was the resource that ranked the worst among the perceived conditions. The King Tide event of December 2008 scoured and destroyed the nearshore seagrass beds in the region giving rise to this accurate perception.

Table 19. Perceived condition of resources, Dabanot, expressed in percentages

Resource	Very Good	Good	Neither	Bad	Very Bad
Coral Reefs	65	35	0	0	0
Fresh Water	70	30	0	0	0
Upland Forest	100	0	0	0	0
Seagrass	15	30	45	10	0

Table 20. Perceived condition of resources, Silom, expressed in counts

Resource	Very Good	Good	Neither	Bad	Very Bad
Coral Reefs	2	0	2	0	0
Fresh Water	4	0	0	0	0
Upland Forest	3	1	0	0	0
Seagrass	0	0	4	0	0

16) Perceived Threats to Coastal and Marine Resources [T3]

Respondents from Dabanot and Silom identified a number of threats to their marine resources and ranked the level of threat from Low to High (Table 21). These threats can be used to help the communities develop marine management plans that address the highest threats. Note that the category “none” included in the survey questions does not make sense (no one would list something as a threat to then say it isn’t a threat) and will be removed from the survey when administered in the future.

The revised questionnaire asks about the five activities they can think of that would pose a threat to the coastal and marine environment. We have expanded on the table to include the type of impact the threat could cause and also separated threats caused by communities themselves through their actions from those of other major developments or due to decisions made from outside of the community.

Table 21. Perceived threats to coastal and marine resources, Dabanot and Silom

Threat	High	Medium	Low
Derris root	10	7	1
Waste	6	7	1
Breaking corals	7	4	0
Storm waves	7	4	0
Chemicals	9	1	1
Dynamite	4	1	0
Disregard for <i>tambu</i> area	1	4	0
Cyanide	1	0	0
Continuous diving	1	0	0
Use of microfilament net	0	1	0

Key Informant Information

During the third training in Dabanot, participants learned about Key Informant interviews, designed surveys intended to target key informants, and identified ten target key informants to survey. Monitors were unable to meet with many of these key informants over the period and they were unable to complete many of the interviews. Trainers decided to focus training and analysis efforts on the Household surveys. The revised Key Informant survey form will be given to monitors from Dabanot and Silom so that they can administer the surveys to those key informants when they are available.

5. Conclusion and Recommendations

Conclusions

This was the first time for all of the socio-economic monitors to participate in socio-economic training and data collection. We consider this exercise’s primary result as the *training* of some local people to assess their own community’s condition through surveying as well as empowering them in conducting surveys and providing a sense of how such surveys could benefit their understanding of their own communities’ needs. Some of the questions were poorly designed and some data was not collected properly so not all can be used or interpreted with great confidence at this stage. However with more

experience in conducting the surveys, we believe the community monitors could develop the necessary skills to conduct and analyze survey data in the future.

In both of the field training workshops, monitors were better able to conduct the Household surveys over the Key Informant surveys. The indicators within the Key Informant survey are more challenging questions, deal with more challenging concepts, and the formats and content as originally lifted from the SEM-Pasifika manual are not always applicable or easily understood within our communities. The second workshop and survey exercise within Ungakum acted much like a testing ground for questions and the training within Dabanot was an opportunity to hone the questions further. Unsurprisingly, still further survey tweaking was needed.

During the Dabanot workshop, we were able to take the monitors through from developing the questions to gathering the data followed by analyzing the data so it could be presented back to the community. This helped the monitors understand the importance of collecting data properly and how it contributes to the quality of the results presented back to the community.

The findings appear to indicate that in both communities there is mixed knowledge of the marine and coastal resources surrounding the communities and their importance. While marine resources are an important component of resident livelihood, a greater proportion of livelihood generation originated from terrestrial sources and activities than marine sources and activities. Many of the recommendations that stem out of this survey confirm needs already identified by the community monitors over discussions during the first workshop.

Recommendations

From the survey's findings, it is recommended that:

- (1) An Education and Awareness Program be developed and that would target the following issues or topics:
 - Basic marine education on specific ecosystems and organisms (Corals, Seagrass, Fish, Sea cucumbers, etc.)
 - Basic education on the impacts of trash in the marine environment (Plastic, Batteries, etc.)
 - Impacts of destructive fishing on marine systems and resources
 - Impacts on land based activities to marine ecosystem – cause and effect for both ecosystems.
 - Principles of Management
 - Benefits of management
- (2) Awareness programs should target students as well as adults since students make up a huge proportion of the communities' populations.
- (3) Findings from these surveys can be presented back to community members during upcoming meetings so that they can contribute to improving marine management plans to better address their needs and concerns.
- (4) Community awareness in Dabanot needs to address the issue of community involvement and participation. Some community members refused to be a part of the survey because they felt left out in the *tambu* area management process. The whole community needs to feel they are part of the process; in many situations although one clan may claim ownership of the *tambu* area the community has user rights which allow them to access the reefs.

Revised Surveys

Through this process, various edits have been identified to improve the survey forms for better and easier delivery of the questions for the monitors. It is a general consensus among the trainers and some of the participants that it would be valuable to develop a *single* Household Survey Form and

single Key Informant Survey form to be used in all four target communities. This stems from three points:

- 1) The management objectives and assessment objectives are similar across all four communities.
- 2) Monitors from four different communities were involved and participated in surveys in communities other than their own. This has created a pool of trained monitors and allowed communities the opportunity to learn from one another. And created a small team of monitors who can work in communities other than their own to administer surveys. This would be easiest if surveys were the same across all the communities.
- 3) The same survey would allow between-community comparisons.

Revised Household and Key Informant surveys have been designed (see Appendix). These surveys will be distributed to trained monitors from Ungakum and Kavulik in order to encourage a stage four component to this project, namely for both surveys to be administered in Kavulik by trained monitors on their own. They will also be shared with monitors from Dabanot and Silom to allow them the opportunity to administer, in particular, the Key Informant survey in their communities.

6. Appendices

1. Workshop participants
2. Revised survey forms
3. Original survey forms

Appendix 1. Workshop participants

Participants of the SEM-Pasifika Workshop, May 18th – 21st, 2010 Kaselok, New Ireland

WCS PNG Marine Program Staff

Kate Holmes
Rachael Lahari
Tau Morove
Jane Wugen, intern

PNGCLMA Staff

Maxine Anjiga
Rebecca Samuel
Reuben Tuka

Provincial Fisheries Officers

Manaon Manilias, to assist with Ungakum Village, Tsoi Islands
Simeon Agar, to assist with Kavulik Village, Tsoi Islands
Leonard Jahat, to assist with Dabanot Village, Madak
Vaitas Lasaro, to assist with Silom Village, Madak
Elsie Pangogo, region of focus is Mussau Island, assisted with Kavulik Village

Kavulik Village Representatives

Noah Wepo (male)
Pokpokai Malavai (Priscilla) (female)
Marioth Delvin (female)

Ungakum Village Representatives

Elison Watlom (male)
Pedri Pesat (female)
Perry Misiel (male)
Kalina Jackson (female)
Jackson Solo (male)

Silom Village Representatives

Steven Thomas Maves (male), Village Planning Committee Chairman
Winnie Robert (female)

Dabanot Vilage Representatives

Bulake Mai (male)
John Sibe (male)

**Participants of the SEM-Pasifika Workshop, February 28th to March 5th, 2011
Ungakum, New Ireland**

WCS PNG Marine Program Staff

Modi Pontio
Jane Wia
Tau Morove
Jasmine Duadak

PNGCLMA Staff

Rebecca Samuel
Reuben Tuka

Provincial Fisheries Officers

Simeon Agar, assisted with Kavulik Village, Tsoi Islands
Vaitas Lasaro, assisted with Silom Village, Madak

Kavulik Village Representatives

Marioth Delvin (female)
Ranga Kot (male)

Ungakum Village Representatives

Elison Watlom (male)
Pedri Pesat (female)
Perry Misiel (male)
Kalina Jackson (female)
Jackson Solo (male)
Charlie Nelson (male)
Robinson Lisah (male)

Madak Villages Representative

Mena Romus (female)

**Participants of the SEM-Pasifika Workshop, March 28th March - 02 April 2011
Dabanot, New Ireland**

WCS PNG Marine Program Staff

Modi Pontio

Jane Wia

Tau Morove

Kavulik Village Representatives

Marioth Delvin (female)

Ranga Kot (male)

Ungakum Village Representatives

Jackon Solo (male)

Perry Misiel (male)

Silom Village Representatives

Agesta Daniel (female)

Elsa Semmy (female)

Daniel Apau (male)

Dabanot Village Representatives

Mena Romus (female)

Penius Lemele (male)

John Tengi (male) (observer for a day)

Appendix 2. Revised survey forms

Household Survey Form

Site Peles: _____

Name of Respondent - *Nem blo husait man/meri i bekim ol askim:* _____

Date - *Det:* _____

Name of Interviewer - *Nem blo husait man/meri i wokim ol askim:* _____

No.	Name	D4. Age	D6. Sex (F/M)	D7. Years of formal education	Clan name	Place of origin (this Community, LLG, District, Province, other Province).	How long have you lived here in years	What was your reason for coming to this community	D9. Denomination	D11. Occupation <i>Wanem kain ol wok u na ol haus lain blo u isave wokim long kisim moni o kaikai ikam insait long femili o haus?</i>	
	<i>Nem blo ol haus lain</i>	<i>Krismas bilong olgeta haus lain</i>	<i>Man o meri</i>	<i>Pinisim skul lo wanem graid</i>	<i>Nem bilong klan bilong u</i>	<i>Yu blong we? Dispela komuniti, dispel LLG, dispela distrik, dispela provins o narapela provins?</i>	<i>Hamas yia u bin stap pinis long dispela ples?</i>	<i>Bilong wanem as u kam stap long hia?</i>	<i>Wanem lotu bilong u?</i>	Primary <i>Nambawan wok</i>	Secondary <i>Namba tu samting</i>
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

D12(a). How do you get food or money to support you and your household?

Wanem ol wok u na ol narapela haus lain bilong u save mekim long kisim moni na kaikai ikam insait long famili/haus?

Activity	Mark the activities your family does	Who does this work (men, women, children)?	How many people engage in the activity?	Rank each marked activity in order of importance from the most to the least important starting with 1 = Most Important.
Wok	Makim ol wok we haus lain i wokim	Husait i mekim (man, meri, pikinini)?	Hamas man o meri i mekim dispel wok (#)?	Makim wanem em impotent igo inap long wanem em ino impotan. 1 = impoten antap.
Fishing <i>Painim pis</i>				
Gleaning <i>Kisim sel/urita</i>				
Commercial fishing <i>Baim/salim pis/pislama/lalai/gramsel na ol narapela samtin bilong solwara</i>				
Gardening <i>Wok gaden</i>				
Cocoa and copra <i>Wok kakao/kopra</i>				
Employed <i>Wok fotnit</i>				
Payment from tourism related work <i>Wok turis</i>				
Market sales <i>Salim ol kaikai na ol narapela samtin long kisin moni (haus maket)</i>				
Remittance <i>Ol narapela samtim olsem kisim halivin long ol family i wok long ofis</i>				
Hunting <i>Painim welabus</i>				
Sale of timber <i>Liklik wok forestry (sawmill)</i>				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				
Tokaut long ol narapela: _____				

D12(b). How much money did you and your family use in the last two weeks? (circle one)

Hamas moni u wantaim femili ibin usim long tupela wik igo pinis? Makim wanpela:

K0 – K20	K20 – K50	K50 – K100	K100 – K200	K200+	No answer
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C1. Coastal and Marine Activities <i>Wanem ol wok ol lain lo ples i save wokim lo nambis na solwara.</i>	C2. Goods and Services <i>Wanem ol samtin ol lain lo ples isave kisim long dispela wok.</i>	C5. Proportion of dependency	
		% own consumption <i>Hamaspla yupla yet kaikai</i>	% sale <i>Hamaspla blo salim</i>

C10. Knowledge of Coastal and Marine Resources

Bilong wanwan statmen,(or tokaut?) makim sipos u tingim se em i tok tru or tok giaman. (✓)

Coastal & Marine resource knowledge statements	True <i>Tok tru</i>	False <i>Tok giaman</i>
Coral is a living animal. <i>Korol I animol we igat laip.</i>		
Seagrass provide habitat for baby fish. <i>Sigras em hap blong ol liklik pis lo stap na kaikai.</i>		
Breaking corals to catch octopus is not destructive to the reef. <i>Burukim korol lo kisim urita ino bai bagarapim rip.</i>		
The tambu area will contribute to increase the supply of fish in the whole area. <i>Tambu aria bai halivim long saplaim ol pis long olgeta hap rip insait long peles.</i>		
Coral bleaching is a sign of healthy reefs. <i>Taim kala blong korol i tanim igo wait em soim olsem korol i stap gut.</i>		
Breaking of live corals for lime production is a sustainable income generating activity. <i>Pasin blong burukim korol blong wokim kambang emi gutpla blong lukaut blong ripKambang ston bai stap yet lo solwara blong ol man meri lo go kisim na wokim kambang blo salim.</i>		

C11. Attitudes toward Coastal & Marine Resources

Bilong wanwan tokaut, makim sipos em i wanbel stret, wanbel, no save, ino wanbel. o ino wanbel stret waintaim tokaut. (√)

	1	2	3	4	5
Attitude statements	Strongly Agree Wanbel stret	Agree Wanbel	Neither No save	Disagree Ino wanbel	Strongly Disagree Ino wanbel stret
I would vote for a tambu area near my village. <i>Sapos ol ibin askim tingting blo mi, bai mi tok orait lo putim tambu aria lo ples blo mi.</i>					
It is important that all community members look after the reefs. <i>Olgeta lain long peles mas lukautim gut hap solwara na rip blong yumi.</i>					
My family's health and well-being is linked to the health of our marine habitats. <i>Gutpla sindaun blo femili blo mi i pas wantem gutpla blong rip na solwara.</i>					
It is an important part of our culture to have a healthy marine environment. <i>Em bikpla samting insait long pasin kastom blo mipla long gat gutpla solwara.</i>					
The sea as a good place to dispose of rubbish from the village. <i>Solwara i gutpla hap long toromoi ol pipia.</i>					

C12. Non- Market and Non-Use Value

Bilong wanwan tokaut, makim sipos em i wanbel stret, wanbel, no save, ino wanbel. o ino wanbel stret waintaim tokaut.. (√)

	1	2	3	4	5
Non-market Non-Use Value Statements	Strongly Agree <i>Wanbel stret</i>	Agree <i>Wanbel</i>	Neither <i>No save</i>	Disagree <i>Ino wanbel</i>	Strongly Disagree <i>Ino wanbel stret</i>
The reefs are important for protecting land from storm waves <i>Wanpla wok we rip isave wokim em lo pasim si lon kam antap na bagarapim nambis na giraun.</i>					
Tambu areas should be restricted to those areas where no one goes fishing <i>Putim tambu aria long hap we ol man ino save go painim pis long em.</i>					
Coral reefs are only important if you fish or dive <i>Ol we isave go galas na painim pis tasol bai tingting planti long ol korol rip i gutpla samting long husait isave go galas o huk.</i>					
An important role the sea plays is to remove waste from our beaches <i>Wanpla bikpla wok solwara isave wokim em lo rausim pipia blo yumi.</i>					
Seagrass beds have no value to people <i>Sigaras i garas nating na nogat wok blong ol.</i>					
When coral reefs are protected, we will have enough food for our families. <i>Taim yumi lukautim korol rip yumi bai gat inap kaikai bilong femili.</i>					
One of the benefits of having a tambu area is to maintain the natural environment for future generations. <i>Wanpela gutpela samting blong kamapim ol tambu aria em long lukautim gutpla peles blong mipela blong nau na bihain taim.</i>					

T2. Perceived Resource Condition

How would you describe the current condition of each of the following resources?

Nau lo displa taim, long skelim blong u, u ting ol displa risos istap olsem wanem? (✓)

	Very Good (1) <i>Gutpela tru</i>	Good (2) <i>Gutpela</i>	Don't know (3) <i>No save</i>	Bad (4) <i>Nogut</i>	Very bad/poor (5) <i>Strongly nogut tru</i>
Coral reefs <i>Korol rip</i>					
Fresh water <i>Fres wara</i>					
Upland forest <i>Bus</i>					
Seagrass <i>Sigras</i>					

T3. Perceived Threats to Coastal and Marine Resources

What do you think are the major threats to coastal and marine resources?

Lo tingting blo u, wanem ol samting u ting iken bagarapim ol samting lo solwara na nambis? (✓)

(a) Threats from community activities

List up to five COMMUNITY ACTIVITIES happening in your community that threaten your marine resources <i>Namim five pela wok ol komunitu i mekim we iken bagarapim solwara bilong u</i>	High <i>Antap</i>	Medium <i>Namei</i>	Low <i>Tamblo</i>	Type of impact <i>Wanem bagarap iken kamapim</i>

(b) Threats from major development activities

List up to five big DEVELOPMENT ACTIVITIES happening in your community that threaten your marine resources <i>Namin five pela bigpela wok ikamap lon komuniti bilong u we iken bagarapim solwara bilong u.</i>	High <i>Antap</i>	Medium <i>Namei</i>	Low <i>Tamblo</i>	Type of impact <i>Wamen bagarap iken kamapim</i>

M11. Awareness of Rules and Regulations

Activities	Rules exist (Y/N)
Fishing (In tambu area) <i>Painim pis lo tambu eria</i>	
Use of derris root <i>Usim ol bun rop</i>	
Breaking corals <i>Burukim haus blo pis</i>	
Walking in tambu area (during low tide) <i>Wokabaut antap lo tambu eria lo taim blo drai rip</i>	
Fishing at night (spear gun) <i>Painim pis long nait</i>	
Use of gill nets with mesh size < 2.5 inches (National Fisheries Authority) <i>Usim bung aninit long 2.5 ins</i>	
Closure of beche-de-mer fisheries (National Fisheries Authority) <i>Lo paism ol lain lo kisim pislama we ibin kamap lo 2010 na bai igo inap 2013</i>	

C13. Alternative & Supplementary livelihoods

- a. What income generating activities did you or any other members of your household engage in the last 5 years?

*Long faivpla yia igo pinis, wanem kain ol narapla rot u o hauslain blo u bin kisim moni lo em?
(samting we u no wokim nau)*

- b. Why did you stop these activities? And do you think you could do any of them again?

Bilong wanem u lusim ol displa wok? U ting u bai inap wokim ol sampla blong ol gen?

D13. Household material (circle)*Ol samting bilong wokim haus (makim wanwan ol igat):*

Roof:	Iron roof	Thatched sago leaf	Kunai/grass roof	Narapela: _____		
Outside walls:	Coconut leaf	Sago leaf	Sago fronds	Bamboo	Fibro	Timber
Windows:	Louvers/ Glass	Timber shutters	Curtains	No window cover	Narapela: _____	
Floor:	Graun/ Sand	Sago fronds	Black palm	Timber	Cement	Narapela: _____
Toilet:	Pit toilet	Flush toilet	No toilet	Narapela: _____		
Water:	Tap/piped	Water well	River	Tank water	Narapela: _____	
Light Lait:	Botol tin lamp	Candle – kendol	Hurricane lamp	Pressure lamp	Generator	Narapela: _____

Household furnishings - Handmade (H) or bought in shop (B)

Makem **H** (Wokim long **han**) o **B** (**Baim** long stoa) long wanwan bilong ol samting igat long dispela haus. U ken adim moa.

Chairs ()	Cupboard ()	Table ()	Shelves ()	Bed ()	Mattress ()	_____ ()
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Home appliances (circle)*Ol samting long haus (makim wanwan ol igat)*

VCD/DVD player	Generator	Bartri long car	Sola powa	Sewing machine	Torch	Clock
Fan	Fridge	Radio/cassette player/bum box	Mobile phone	Gill net	Gun	TV
Canoe	TV	Chainsaw	_____	_____	_____	_____

Productive assets (circle)*Ol samting bilong winim mane (makim wanwan ol igat na usum bilong winim mane)*

Vehicle	Dinghy	Engine	Gill Net	Generator	Chainsaw	Wokabaut sawmill
Vegetable Garden	Cocoa plantation	Coconut plantation	Oil Palm plantation	Buai plantation	Tobacco garden	Canteen
Pigs for selling	Chickens for selling	House for rent	TV/DVD player	Satellite dish	_____	_____

Key Informants Survey Form

Site - Peles: _____

Name of Respondent –

Nem blo husait man/meri i bekim ol askim: _____

Date - Det: _____

Name of Interviewer –

Nem blo husait man/meri i wokim ol askim: _____

C1. Coastal and Marine Activities	C2. Goods & Services	C3. Harvesting methods and means of services	C6. Type of use by outsiders	C7. Monetary Value (high, medium, low)		
Wanem ol wok ol lain lo ples i save wokim lo bus na solwara	Wanem ol samting ol lain lo ples isave kisim long ol displa wok	Wanem samting ol lain save usim long wok lo bus na solwara.	Wanem kain wok ol lain arasait long ples isave kam wokim long peles	Moni mak blo ol samting ol lain kisim lo bus o solwara. Makim wanpla. (✓)		
				Bikpla moni	Planti moni tumas	Liklik moni tasol

C8. Market of Coastal and marine Goods and Services

C2. Coastal and Marine Goods & Services	C8. Markets		
	% International	% National	% Local
Wanem ol samting ol lain lo ples isave kisim long ol displa wok long bus na solwara	Arasait lo PNG	Insait lo PNG Arasait lo Niu Ailan	Insait lo Niu Ailan

C9. Gender Roles and Responsibilities in Coastal and Marine Activities

[illegible]

D2. Number and Profile of Visitors

[illegible]

ST1. Stakeholder groups

Identify the stakeholders involved in coastal management decision-making, planning, implementation, and monitoring.

Neimim ol lain o grup istap insait lo wok bilong lukautim ol marin risos long ples.

Stakeholder <i>Grup or lain insait lo wok bilong lukautim ol marin risos long ples bilong u</i>	Type of involvement <i>Long wanem kain rot?</i>

ST 2. Stakeholder's participation in management.

C1. Coastal and Marine Activities	Stakeholder group 1. Direct resource users	Stakeholder group 2. Those affected by coastal resource use & management	Stakeholder group 3. Those who do not use or impact the resources but have a stake in management
<i>Wanem ol wok ol lain lo ples i save wokim lo bus o solwara</i>	<i>Ol lain long peles we isave go kisim ol risos lo bus o solwara</i>	<i>Ol lain we ino save go olyet long kisim ol samting long bus o solwarablong displa peles tasol ol isave kisim sampla kain halivim long ol displa samting (ol baya)</i>	<i>Ol lain usait ino save usim ol risos we istap insait long bus o solwara blong displa tasol ol igat laik long wok blong lukautim ol displa samting</i>

M2. Management types and structures

12 (a). Describe the type of management at the site?

Wanem kain marin risos menismen istap long ples bilong u?

12 (b). Identify and describe the institutions and organizations that have decision-making and management authority for the site.

Nem bilong ol lain isave wok bung long lukautim tambu rip bilong u na wanem kain wok ol mekim.

Organization/Individuals	Type of involvement (decision making and management authority for the site)
<i>Ol man o organisation</i>	<i>Wanem kain wok or powa ol igat long lukaut long tambu aria bilong u.</i>

Appendix 3. Original survey forms

Household Survey Form – Dabanot and Silom

Site: _____

Name of Interviewer: _____

Date: _____

Name of Interviewee: _____

Name	D4. Age (<i>Krismas</i>)	D6. Sex (F/M)	D7. Years of formal education	D7. Place of origin (<i>Asples/ Waira</i>)	D9. Church	D11. Occupation	
						Primary	Secondary

D12. Sources of Household Income	Primary (✓)	Secondary (✓)

D13.

Household material and appliances

Type of roof: _____

Type of outside structural walls: _____

Windows: _____

Floors: _____

Toilet: _____

Water: _____

Lighting source: _____

Household furnishing (Handmade or bought in shop)

Home appliances (Battery operated)

Productive assets

C1. Coastal and Marine Activities	C2. Goods and Services	C5. Proportion of dependency	
		% own consumption	% sale

C10. Knowledge of Coastal and Marine Resources (√)

Coastal & Marine resource knowledge statements	True	False
Coral is a living animal		
Seagrass provide habitat for baby fish		
Breaking corals to catch octopus is not destructive to the reef		
The tambu area will contribute to increase the supply of fish in the whole area.		
Coral bleaching is a sign of healthy reefs		
Breaking of live corals for lime production is a sustainable income generating activity		

C11: Attitudes toward Coastal & Marine Resources

Attitude statements	1 = Strongly disagree	2 = Disagree	3 = Neither	4 = Agree	5 = Strongly agree
I would not vote for a tambu area near my village					
It is important that all community members look after the reefs					
My family's health and well-being is linked to the health of our marine habitats					
It is an important part of our culture to have a healthy marine environment					
It doesn't matter what happens to our marine environment					

C12: Non- Market and Non-Use Value

Non-market Non-Use Value Statements	1 = Strongly disagree	2 = Disagree	3 = Neither	4 = Agree	5 = Strongly agree
The reefs are important for protecting land from storm waves					
Tambu areas should be restricted to those areas where no one goes fishing					
Coral reefs are only important if you fish or dive					
An important role the sea plays is to remove waste from our beaches					
Seagrass beds have no					

value to people					
When coral reefs are protected, we will have many fish to catch					
We should set aside an area of our coastal and marine area so that future generations can have a natural environment and be able to see what we see now					

C13. Alternative & Supplementary livelihoods

- a. What other income generating activities did you or any other members of your household engage in 3 -5 years ago?

- b. Why did you stop these activities? And do you think you could do any of them again?

T2. Perceived Resource Condition

How would you describe the current condition of each of the following resources?

	5 = Very good	4 = Good	3 = Neither	2 = Bad	1 = Very bad
Coral reefs					
Fresh water					
Upland forest					
Seagrass					

T3. Perceived Threats to Coastal and Marine Resources

What do you think are the five major threats to coastal and marine resources? (√)

Threats	High	Medium	Low	None
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M11: Awareness of Rules and Regulations

Activities	Rules exist (Y/N)
Fishing (In tambu area)	
Use of derris root	
Breaking corals	
Walking in tambu area (during low tide)	
Fishing at night (spear gun)	
Use of gill nets with mesh size < 2.5 inches (National Fisheries Authority)	
Closure of beche de mer fisheries (National Fisheries Authority)	

Key Informants Survey Form – Dabanot and Silom (revised version)

Site: _____

Name of Interviewee: _____ Date: _____

Name of Interviewer: _____

C3. Harvesting methods and means of service

C1. Coastal and Marine Activities	C2. Goods & Services	C3. Harvesting methods and means of services	C6.Type of use by outsiders	C7.Monetary Value (high, medium, low)
<i>Wanem ol wok ol lain lo ples i save wokim lo nambis na solwara</i>	<i>Wanem ol samting ol lain lo ples isave kisim long ol displa wok</i>	<i>Wanem samting ol lain save usim long wok lo nambis na solwara</i>	<i>Wanem kain wok ol lain arasait long ples isave kam wokim long ples Silom/Dabonot</i>	<i>Moni mak blo ol samting ol lain kisim lo nambis o solwara</i> <i>(bikpla moni/ino planti moni tumas/liklik moni tasol)</i>

C8. Market of Coastal and marine Goods and Services

C2. Coastal and Marine Goods & Services	C8. Markets		
	% International	% National	% Local
<i>Wanem ol samting ol lain lo ples isave kisim long ol displa wok</i>	<i>Arasait lo PNG</i>	<i>Insait lo PNG</i> <i>Arasait lo Niu Ailan</i>	<i>Insait lo Niu Ailan</i>

C9. Gender Roles and Responsibilities in Coastal and Marine Activities.

C1. Coastal & Marine Activities	Sex and Age group		Explanation (why are activities carried by only males or females)
<i>Wanem ol wok ol lain lo ples i save wokim lo nambis na solwara</i>	<i>Man o meri , hamas krismas ?</i>		<i>Tok klia</i>
Extractive <i>Rausim kam aut lo solwara & nambis</i>	<i>Meri</i>	<i>Man</i>	
Non – extractive <i>Go lukim o usim tasol</i>			

D2. Number and Profile of Visitors

Type of Visitors	Number per year	Purpose
<i>Wanem kain visitas</i>	<i>Namba blo ol man lo wanpla yia</i>	<i>As tingting</i>

ST1: Stakeholder groups

Identify the stakeholders involved in coastal management decision making, planning, implementation, and monitoring.

Neimim ol lain o grup istap insait lo wok bilong lukautim ol marin risos long ples Dabanot/Silom?

In what way? *Long wanem kain rot?*

ST 2: Stakeholder's participation in management.

C1. Coastal and Marine Activities	Stakeholder group 1: Direct resource users	Stakeholder group 2: Those affected by coastal resource use & management	Stakeholder group 3: Those who do not use or impact the resources but have a stake in management.
<i>Wanem ol wok ol lain lo ples i save wokim lo nambis na solwara</i>	<i>Ol lain long ples we isave go kisim ol risos lo solwara na nambis</i>	<i>Ol lain ino save go kisim ol risos long solwara na nambis tasol ol isave usim ol displa ol risos (eg: ol baya)</i>	<i>Ol lain usait ino save usim ol risos lo nambis na solwara tasol ol igat laik long wok bilong lukautim ol displa risos bilong solwara</i>

M2: Management types and structures

Describe the type of management at the site (Dabonot/Silom)

Wanem kain marin risos menismen istap lo ples Dabonot/Silom?

Identify and describe the institutions and organizations that have decision-making and management authority for the site.

Wanem kain ol lain isave wok bung long lukautim tambu rip bilong ples Dabonot /Silom?
